





PLUS

B

3/85

В

S

S

12

ANCE

Vol. IV No.8

Twelve Monthly Columns, Eight Continuing Departments, a New Adventure Contest, and More Than Two Dozen Software and Hardware Reviews.

MOUNCING 3 Screens-Plus-"INVISO SCREEN"

The First 64K Arcade Game For the Color Computer

The first screen objective is to catch enough of Elsie's kisses (those Red Heart Shaped Things) to fill in the squares on the Sailorman's house. If you can time your punch just so, you can send the punching bag over to knock the bucket down and, with a little bit of luck, right onto Bigfatbadguy's head. This will give you a little (but not much) time to catch all those RHSTs.

You must avoid contact with Bigfatbadguy who is actively pursuing you. You must also be careful of Olduglyseawoman who will appear at higher difficulty levels to chuck empties at you. Either avoid the flying bottles or punch them (with the fire button) to keep from being knocked into

The second screen objective is to collect enough notes to play Elsie a little love song. You may jump off and onto the other end of Fatguyeatingahamburger's teetertotter to fly up a deck and even two decks if you manage to catch hold of Smartaleckkid's grab handles. Time it right and away you go.

The Third screen objective is to collect enough letters (thrown by Elsie's cries for H-E-L-P) to complete a ladder all the way to the crow's nest where Elsie is calling you. Beware of the Crow, however, who thinks you are after her eggs!

On all screens, eating a can of collard greens (labeled "S" for Collard and grasped by punching the can just right) will give you amazing speed, strength and agility and allow you to send Bigfatbadguy into the drink with a single punch.

PLUS...

- 1. All Machine Code
- 2. Save Scores Feature
- 3. Start on any screen
- 4. Set your own difficulty level
- 5. Choose the number of men desired







REQUIRES 64K DISK \$34.95 TAPE \$29.95



TOM MIX SOFTWARE

4285 BRADFORD N.E. GRAND RAPIDS, MI 49506

[616]957-0444





ARCADE ACTION GAMES



From Computer Plus to YOU...

US after PLUS after PL



Model 100 8K \$339 Model 100 24K \$510



Color Computer II w/16K Ext. Basic \$135 w/64K Ext. Basic \$179



Tandy 1000 \$999 Tandy 1200 \$2595







BIG SAVINGS ON A FULL COMPLEMENT OF RADIO SHACK COMPUTER PRODUCTS

COMPUTERS Model 4 Portable	970	ETC. Radio Sho
Model 4 Portable Model 4	970	Radio Sho
Model 1000	999	PBH Ser/P
Model 1200	2595	64K Upgre
Model 2000 2 Drive	2299	Radio Sho
MODEMS		HJL Keybo
Hayes Smartmodem II	215	Radio Sho
Radio Shack AC-3	125	Radio Sho
Radio Shack DC Modem I	89	Radio Sho
Radio Shack DC Modem II	160	Video Plu
Radio Shack DC Modem 2212	315	Video Plu
PRINTERS		Amdek C
Radio Shack TRP100	229	Amdek V
Radio Shack DMP105	160	Amdek V
Radio Shack DMP110	305	Taxan Co
Radio Shack DMP430	660	Taxan 118
Radio Shack CGP220 Ink Jet	545	Radio She
Silver Reed EXP500 D.W.	430	
Star Gemini 10X	289	SOFTWAI
Star Gemini Powertype	345	The Sailo
Panasonic P1091	315	The King Buzzard B
C. Itoh Prowriter 8510	320	Worlds of
Okidata and Epson	CALL	1101103 01

ETC.	
Radio Shack Drive Controller	119
Radio Shack Ext. Basic Kit	39.95
PBH Ser/Par Conv.	69
64K Upgrade Kit	49
Radio Shack Deluxe Keyboard	
HJL Keyboard	79.95
Radio Shack CCR-81 Recorde	
Radio Shack Del. Joystick (each	
Radio Shack Joysticks (pair)	22
Video Plus (monitor adapter)	
Video Plus IIC	39.95
Amdek Color 300	265
Amdek Video 300 Green	145
Amdek Video 300 Amber	159
Taxan Color 220 Monitor	245
Taxan 115 Green	125
Taxan 116 Amber	129
Radio Shack VM-2	139
SOFTWARE (Tape Ve	
The Sailor Man	29.95
The King	26.95
Buzzard Bait	27.95
Worlds of Flight	29.95
•	

Colorpede	29.95
Juniors Revenge	28.95
Pac Attack	24.95
Block Head	26.95
Lunar Rover Patrol	24.95
Lancer	24.95
Typing Tutor	23.95
Galagon	24.95
Scott Adams Adventures	19.95
Sea Dragon	34.95
Colorcome	49.95
Telewriter 64	49.95
Deft Pascal (disk)	79.95
Elite-Calc	59.95
VIP Writer (tape & disk)	69.95
VIP Calc (tape & disk)	69.95
VIP Terminal (tape & disk)	49.95
VIP Database (disk)	59.95
VIP Integrated Library (disk)	149.95
Graphicom (disk)	29.95

Order any 2 software pieces listed and take 10% off their listed price. All Radio Shack software 10% off list. Send for complete list.

CALL TOLL FREE 1-800-343-8124

- LOWEST POSSIBLE PRICES
- BEST POSSIBLE WARRANTY
- KNOWLEDGEABLE SALES STAFF
- TIMELY DELIVERY
- SHOPPING CONVENIENCE







P.O. Box 1094

480 King Street Littleton, MA 01460

SINCE 1973

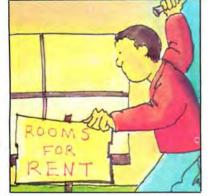
IN MASSACHUSETTS CALL (617) 486-3193

Under The









106

131



Cover art® by Fred Crawford

The small cassette tape symbols beside features and regular columns indicate that the program listings with those articles are on this month's RAINBOW ON TAPE, ready to CLOAD and RUN. For full details, check our RAINBOW ON TAPE ad on Page 91.

NEXT MONTH: April is our Simulations issue. Prepare yourself for a Simulations excursion as we reveal the two grand prize winning programs of our second annual contest, and announce the names of the remaining winners. We'll also include games and a program designed for helping you write animated graphics. For hardware hackers, we'll feature such projects as a Color BASIC ROM switch that allows you to install two different versions of Color BASIC into your computer. And, while you're waxing creative on the Adventure you're devising for our third annual Adventure contest, you may want to check out Eric Tilenius' article on Adventuring for hints

PROGRAMMING TUTORIAL Incorporating joysticks into

164

_____ 167

Calling All CoCo Nuts/Paul Poulosky __

Stock Index/Patrick H. Lowrie, Jr. _

Joystick-to-itiveness/T.C. Taulli _____

on how to compose some lively ideas.

GRAPHICS Why are there so many CoCo widows?

So. You Want To Sell Software/Susan P. Davis _____

BUSINESS Advice on the necessities to get you started

FINANCE Gauge your performance in the stock market

Look for THE RAINBOW for the best articles, programs and reviews anywhere on the Color Computer!

BASIC Training/Joseph K Further venturing with pro Bits And Bytes Of BASIC// Deciphering printer contro Building March's Rainbow/ Comments on our printous	ogram ta Richard		07
Bits And Bytes Of BASIC/A Deciphering printer control Building March's Rainbowa	Richard	ables	97
Deciphering printer control Building March's Rainbown		ibies	
	n coues	l White	28
		eed	16
Byte Master/R. Bartly Bet 6809 Arithmetic — the wa			237
Earth To Ed/Ed Ellers An update on recent CoCo			82
Education Notes/Steve BI Computing interest payme	5 2		175
Education Overview/Micha Reading vs. computers	ael Plog	g, Ph.D	182
Print#-2/Lawrence C. Fall Editor's notes	k		12
Turn Of The Screw/Tony I Constructing 16K of EPRO			54
Wishing Well/Fred Scerbo Answer the challenge of th)		77
will return next month.			
RAINBOWTECH			
Downloads/Dan Downard Answers to your technical			244
Personable Pascal/Daniel Building a program a piece			247
KISSable OS-9/Dale Puck	ett		
An overview of programs,			256
in order of programs,	correcti		256
Restoring OS-9 Files/Brian Now you can recover that	n A. Lai	ntz	
Restoring OS-9 Files/Brian	า A. Lai deleted ู	ntzfile	
Restoring OS-9 Files/Brian Now you can recover that	n A. Lai deleted	ntzfile	265
Restoring OS-9 Files/Brian Now you can recover that DEPARTMENTS Advertiser Index Back Issue Information	n A. Lai deleted 272 267	ntzfile	265 190
Restoring OS-9 Files/Brian Now you can recover that DEPARTMENTS Advertiser Index Back Issue Information Corrections	n A. Lai deleted 272 267 229	ritz file Reviewing Reviews Scoreboard Scoreboard Pointers	190 158
Restoring OS-9 Files/Brian Now you can recover that DEPARTMENTS Advertiser Index Back Issue Information Corrections Letters To Rainbow	7 A. Lai deleted 272 267 229 6	Reviewing Reviews Scoreboard Scoreboard Pointers Submitting Material	190 158 159
Restoring OS-9 Files/Brian Now you can recover that DEPARTMENTS Advertiser Index Back Issue Information Corrections	7 A. Lai deleted 272 267 229 6 120	Reviewing Reviews Scoreboard Scoreboard Pointers Submitting Material To Rainbow Subscription Information	190 158 159 155 81
Restoring OS-9 Files/Brian Now you can recover that DEPARTMENTS Advertiser Index Back Issue Information Corrections Letters To Rainbow The Pipeline	7 A. Lai deleted 272 267 229 6 120 235	Reviewing Reviews Scoreboard Scoreboard Pointers Submitting Material To Rainbow	190 158 159 155 81
Restoring OS-9 Files/Brian Now you can recover that DEPARTMENTS Advertiser Index Back Issue Information Corrections Letters To Rainbow The Pipeline Rainbow Info	7 A. Lai deleted 272 267 229 6 120 235	Reviewing Reviews Scoreboard Scoreboard Pointers Submitting Material To Rainbow Subscription Information	190 158 159 155 81



March 1985

Vol. IV No. 8

Editor and Publisher Lawrence C. Falk

Senior Editor Courtney Noe Technical Editor Dan Downard Submissions Editor Jutta Kapfhammer Copy Editor Tamara Solley Reviews Editor Monica Dorth Editorial Assistants Jody Doyle, Wendy Falk, Debbie Hartley, Belinda Kirby, Suzanne Benish Kurowsky, Lynn Miller, Shirley Morgan, Kevin Nickols Technical Assistant Ed Ellers Contributing Editors Bob Albrecht,

Managing Editor James E. Reed

R. Bartly Betts, Steve Blyn, R. Wayne Day, Tony DiStefano, Dan Eastham, Frank Hogg, Don Inman, Joseph Kolar, Michael Plog, Dale Puckett, Fran Saito, Paul Searby, Fred Scerbo, Richard White

Art Director Sally Gellhaus Assistant Art Director Jerry McKiernan Designers Neal C. Lauron, Eileen O'Malley, Kevin Quiggins

Advertising Coordinator Doris Taylor Advertising Representative Kate Tucci Advertising Assistant Debbie Baxter (502) 228-4492

General Manager Patricia H. Hirsch Asst. General Manager for Finance Donna Shuck Bookkeeper Diane Moore Advertising Accounts Beverly Taylor

Dealer Accounts Judy Quashnock Administrative Assistant to the Publisher Marianne Booth

Manager of Public Relations Charles L. Springer

RAINBOWfest Site Management Willo Falk Director of Fulfillment Services Bonnie Shepard Asst. Customer Service Manager Deidra Henry Customer Service Representative Sandy Apple Word Processor Manager Lynda Wilson RAINBOW ON TAPE Subscriptions Monica Wheat Research Assistants Laurie Falk, Judi Hutchinson, Debbie Leake, Loretta Varda

Dispatch Janice Eastburn Production Assistant Melba Smith

> For RAINBOW Advertising and Marketing Office information, see Page 272

THE RAINBOW is published every month of the year by FALSOFT, Inc., 9529 U.S. Highway 42, P.O. Box 385, Prospect, KY, 40059. Phone (502) 228-4492. THE RAINBOW and THE RAINBOW logotypes are ® trademarks of FALSOFT, Inc.

of FALSOFT, Inc.

Second class postage paid Prospect, KY and additional offices. USPS N. 705-050 (ISSN No. 0746-4797), POSTMASTER: Send address changes to THE RAINBOW, P.O. Box 385, Prospect, KY 40059. Forwarding Postage Guaranteed. Authorized as second class postage paid from Hamilton, Ontario by Canada Post, Ottawa, Ontario, Canada.

Entire contents © by FALSOFT, Inc., 1985. THE RAINBOW is intended for the private use and pleasure of its subscribers and purchasers and reproduction by any means is prohibited. Use of information herein is

any means is prohibited. Use of information herein is for the single end use of purchasers and any other use is expressly prohibited. All programs herein are distributed in an "as is" basis, without warranty of any

kind whatsoever.

TRS-80, Color BASIC, Extended Color BASIC, Scripsit and Program Pak are ® trademarks of the Tandy Corp. CompuServe is a ® trademark of CompuServe Inc.

Subscriptions to THE RAINBOW are \$31 per year in the United States. Canadian rates are U.S. \$38. Surface mail to other countries is U.S. \$68, air mail U.S. \$103. All subscriptions begin with next available issue.

Limited back issues are available. Please see notice for issues which are in print and costs. Payment accepted by VISA, MasterCard, American Express, Cash, Check or Money Order in U.S. currency only.

Product Review Contents

185

LETTERS TO THE RAINBOW

Back One Step — Manually?

Editor:

I am a registered owner of the OS-9 operating system and BASIC09. Recently, I lent my copy of the BASIC09 Reference Guide to a friend of mine to let him try to translate the long decimal algorithm listed in the manual. He lost the manual.

Being the gracious, gentlemanly type, he offered to buy a replacement copy. As you may have heard by now, Radio Shack will not issue for sale any BASIC09 reference material without the actual software. Does this mean they want everyone to pay \$100 for a replacement manual?

I don't need to go on about the marginal durability of the original manual, or how on a multiuser system one might have a need for more than one manual, or that humans sometimes spill coffee, own paper-eating dogs and have destructive children.

I feel this is a definite step into the past for Tandy. I have experienced nothing but excellent support for my CoCo since its purchase. Now that Tandy is offering excellent, high level software, are they going to return to their previous infamous lowlevel support? I certainly hope not!

Jim Taylor Meriden, KS

Editor:

Thank you for forwarding the letter from Jim Taylor and giving us an opportunity to help and comment.

There is a mechanism for purchasing replacement copies of any software manual which is lost or destroyed. It's done on a case-by-case basis, through our Customer Services department in Fort Worth. I'm sorry his local store didn't make him aware of it, but we will take care of his problem from here.

We'd like to be able to furnish replacement

manuals freely, but there is a reason why we can't. I don't need to explain the well-publicized problem of "software piracy." Disks are easily copied, and the only thing needed becomes the manual. Understandably, software authors/publishers are cautious about requests for manuals — especially since most of our disks are not copy-protected, for the user's convenience. In an effort to protect the software authors, we have had to tightly control the availability of spare manuals. But, I emphasize, single copies are available when legitimately needed.

The industry hasn't decided on the question of multiuser systems or local area networks. Perhaps site licenses, perhaps a fairly high price for additional manuals, perhaps some type of hardware or software "protection." It's not an easy problem, and unfortunately no solution is likely to be acceptable to everyone.

Ed Juge Director of Market Planning Radio Shack Ft. Worth, TX

'GRANTING' A WISH

Editor:

Sometime back I purchased OS-9, BASIC and the C Compiler programs for my CoCo (with two Radio Shack disk drives). The documentation I received with these packages left a great deal to be desired.

It took a number of calls to Fort Worth to learn how to load the BASIC09 program. Now I am trying to use the C Compiler package, and find that the manual tells me nothing about the mechanics of using the two disks that are furnished, i.e., which disk goes in which drive at what point in the program development cycle. Again, I have had to depend on the phone to obtain step-by-step instructions.

During the Civil War, General U.S. Grant kept a colonel on his staff for a single purpose. This colonel was not the smartest of people, and Grant would have him read every order Grant wrote prior to publishing it. Grant believed that if the colonel understood the meaning of the order, then it was safe to send it out, as every member of the command would understand it.

My fondest wish is that people who write manuals for hardware and software would take Grant's lead, and utilize someone such as myself (or Grant's colonel) to test the instructions in the manual prior to its release.

> Arthur E. Schmidthans Marysville, WA

SIGN ON

Editor:

I have a cassette-based upgraded 64K CoCo. I am wondering if there is anyone interested in having a deaf pen pal. I am deaf myself, and have enjoyed using the CoCo since 1982. Please write to me at 30 Lowenthal Road, #2166, 14623-5669.

James Sharer Rochester, NY

HINTS AND TIPS

Editor:

I look forward to reading your fine magazine every month and I have a programming tip I would like to share with my fellow readers.

If you have made many changes to a program that contains GOTOS and GOSUBS, type RENUM nonnon, nonnon where "nnnnn" is any number larger than the last line number of your program. This will give you a UL Error for every GOTO and GOSUB line that you deleted without changing any line

numbers of the present program in memory. Now it is quite easy to fix these deletions because your present LLISTing is still valid. Only after a successful RENUM nnnnn, nnnnn should you renumber the program the way you intended.

Richard F. Sganga Brentwood, NY

MACHINE LANGUAGE TIME-SAVER

Editor:

For those readers who dread typing all those "&H"s in front of the machine language source code, or who don't like converting the code to decimal, here is a time-saver for making and reading data statements in your BASIC program to poke the machine language program into memory.

FOR X = (address) to (address)

READ AS

B = VAL (... &H .. + A\$)

POKE X, B

NEXT X

Source code is put directly into data statements, resulting in about half of the normally required memory to be used.

Also, could you explain the use of the "speed poke" and its limitations?

Kent Maneth Manhattan, KS

Editor's Note: The speed-up poke POKE 65495, 0 switches the CoCo from its normal speed mode into one where the computer runs at twice its normal speed much of the time. In this mode, the SAM (synchronous address multiplexer) chip switches between the two speeds, depending on what operations the 6809 processor is performing. Unfortunately, many CoCos can't run at high speed reliably and many more start to have problems when a disk controller is attached.

I/O DILEMMA SOLVED

Editor:

I recently solved a tape I/O problem that may not be common, but I would like to pass it on in hopes it might help someone else with a similar problem.

I had a long program on tape that

developed an I/O problem near the end of the tape, and I had no backup. I disassembled the ROM routine for cassette loads and noted that ROM does a NEW when it encounters an I/O. I noted on the cassette counter where the I/O occurred and pressed the Reset button just before reaching the I/O. I peeked the beginning of the program from bytes 25 and 26. In direct mode, I ran

to the end of RAM in which each memory byte was peeked, and the value peeked was converted to a CHR\$ and printed to the screen. When the loop reached the end of the program in memory, I broke the loop and asked for the value of the loop variable. I then poked that value into bytes 27 and

a loop from the start of the program through

I then poked that value into bytes 27 and 28 (end of program pointer). I then did a CSAVE.

This routine allowed me to salvage almost

This routine allowed me to salvage almost all of the program up to the I/O. I loaded what I had, typed in the missing lines that

had been lost due to the I/O, and re-saved.

Of course, the begin and end locations of a program have to be converted into most significant and least significant bytes before poking them into the BASIC pointers 25 through 29.

This procedure saved the program from the dreaded I/O, and was a lot faster than retyping the whole program. Still, it remains the best policy to backup anything you don't want to lose. Hope this is helpful.

Paul N. Despres West Wareham, MA

SPOOKED BY 'NO GHOSTS'

Editor:

I made many unsuccessful attempts to CSAVE the short program entitled *No Ghosts* which appeared on Page 147 in the January 1985 issue of THE RAINBOW.

I finally called the customer service representative at our local Radio Shack Computer Center and he informed me that sometimes a PDKE command in a program will prevent the program from being saved on tape. He suggested I type the program into the computer and then try putting it on tape without running it first, and it worked.

This is the first time I have ever run into this situation, and thought some of your other readers may have experienced the same problem at one time or another.

I have been receiving THE RAINBOW for over two years and think it is a wonderful magazine.

Dale W. Reed Massillon, OH

SEVERAL SLEUTH SOLUTIONS

Editor:

In the January 1985 issue of THE RAINBOW [Page 10], Mr. Eric W. Lund asks if anybody knows where to get more evidence in Computerware's Sam Sleuth on Level 2. I wrote this Adventure/Simulation for Computerware and may be able to help out. Sam Sleuth is set up so every time you try to solve each of the three cases, the program picks randomly from several different possible criminals, clue locations, and so on. The point I'm making is if you find evidence somewhere during one session, that same evidence might not be there the next time you play. The game was created this way so you can play the same cases many times before figuring out all of the possible solutions.

It seems Mr. Lund has figured out the case and is just having trouble proving it. Ask people questions and examine everything (even empty lots!). Even how a person's day has been going can sometimes provide information. Writing down notes about objects on the map included in the instruction booklet may also help out. Good luck!

Steve Hartford Glendale, CA

THE LONG AND WINDING RIBBON

Editor:

This is just some information that may

be of use to one of your writers whose address was not in your magazine. Mr. R. George, IV of Terrace, N.M. ["Letters To Rainbow," December 1984, Page 8.]

I do not have a printer like that described, but I do have the very old Centronics/Radio Shack printer that uses the very long ribbon (the printer is Cat. No. 26-1152 — but I cannot find the ribbon number). The last time I looked, the Computer Store stocked these ribbons in a pack of three. It won't be easy to adapt this ribbon for use in another printer, but at least the ribbon itself should be long enough!

Paulette Grantham Palo Alto, CA

TAROT HARMFUL?

Editor

Like everyone else, I am a great lover of THE RAINBOW and the day of its arrival is cause for great excitement. The October 1984 issue, [Page 74], however, contained an article that disturbed me a great deal. I am referring to the *Tarot* program. To some it may seem like a harmless game, but a great many people have fallen under the influence of the Devil just by "playing" with seemingly "harmless" things such as this program.

I have removed the offending program from my copy of the magazine and destroyed it, the only time I have ever cut it. If this comment causes someone to stop and think for a moment before including such things in a future issue, this letter has served its purpose.

I know it's a hard job to try and please everyone all the time and I think you do a good job overall. Keep up the good work!

> Charles Brite Canton, OH

KUDOS

Editor:

I am really enjoying your magazine and especially like the "Personable Pascal" column, Keep that one coming!

Doc M. Pepper League City, TX

FLATTERY FOR FRED

Editor.

Congratulations to Fred Crawford for his January 1985 RAINBOW cover. It's a classic, with the same feel as a Norman Rockwell. His other covers have been OK; this one is tremendous.

Dean Rector Knoxville, TN

DISK LIBRARY

Editor

I have subscribed to THE RAINBOW and RAINBOW ON TAPE for two years. I look forward to each month's issue with great anticipation. THE RAINBOW gives a feeling of belonging to a CoCo Community of users from all over the world.

Recently, I have taken the advice of many letter writers and authors in THE RAINBOW and purchased my first disk drive. Wow! Now only did the speed impress me, but it added a new dimension to my computing. Getting out my old copies of THE RAINBOW, I was very pleased to find I already had a library of disk software at my disposal, and thanks to RAINBOW ON TAPE, ready to run.

RAINBOW, you're the best!

Stephen Duff Kindersley, Saskatchewan

INFORMATION PLEASE

Editor:

I hope the folks at Tandy appreciate your magazine. I don't know that I would own a CoCo if it weren't for RAINBOW. You show a concern for your readers not seen in other publications. With your reviews, articles, certifications, RAINBOW ON TAPE, plus other services, RAINBOW is an essential peripheral to the Color Computer.

I am a novice CoCo user and would like some advice as to where I can get books or other sources of information on ASCII, machine language, Hex, technical data, etc. Write me at 41 Joe Avenue, 04901.

Larry Jackson Winslow, ME

POKES, DISKS AND TAXES

Editor:

I would like to ask if anyone knows of

a way to use the PDKE 65495,0 with a disk drive. It always crashes when I try to use it

Also, I would like to know if anyone knows of a good program that will help you fill out your income tax return. Write to me at 7821 Lland Aye., 76116.

Thanks a bunch and keep up the good work

Chris Young Fort Worth, TX

PIGGYBACK PREDICAMENT

Editor:

I was really excited about the article on "128K The Easy Way" [December 1984, Page 162]. There is a term in the article I have seen elsewhere with respect to upgrading to 64K and I am not too sure what is meant by it. I am referring to "piggybacking." I guess I just don't know as much as I thought.

In another article in the December issue, there is a reference again to piggybacking. It sounds as if one IC was being soldered to the other IC (i.e., pin I to pin I, pin 2 to pin 2, etc.) then replacing the IC combination in the IC socket. Not being familiar to the days of piggybacking 16K chips, etc., I must admit to not knowing what it is I am being asked to do.

Editor's Note: The way it sounds to

Help, please! Thanks.

Rev. Ted Power Assiniboia, Saskatchewan you happens to be precisely right. The reference to "piggybacking" is the soldering of one IC to another.

PHYSICIAN'S FRIEND

Editor:

I would like to know if anyone has written patches to the *Telewriter-64* to allow either an auto-repeat function when any key is held down, or a key-beep option.

Also, I would like to know if there are any other physicians who are using their CoCos for small record keeping in their

Write to me at 4944 N. Larkin, 53217. Thank you for your time.

Stephen A. Haughey, M.D. Whitefish Bay, WI

GAME-MAKER

Editor:

Can anybody tell me where I can get software to make games? The Apple uses the *Arcade Machine*. Any help would be appreciated. Send all information to 816 Belleville Street, 62254. Also, I think your magazine is really great.

Charles Farris Lebanon, IL

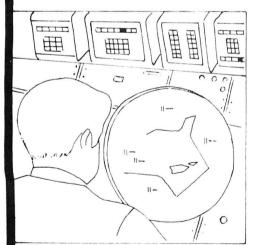
INTO THE WILD BLUE YONDER

Editor:

I love your magazine and am always excited to see my next issue. I am

Imagine Yourself Positioned At A Radar Console. Aircraft In The Vicinity Of A Major Airport Are On Display, All Awaiting Your Next Command. You Are In Charge. You Are The Controller With The...

AIR TRAFFIC CONTROL SIMULATOR *



You've heard about our crowded skys and the concerns for air travel safety. Have you ever wondered how the system works? Now you can learn. This realistic, full-featured, educational simulation package includes everything you need to learn about ATC and actually take control:

- · Air Traffic Control Simulator software on diskette or cassette.
 - 100% machine language for high performance.
 - Provides a realistic Air Traffic Control environment within which you must utilize your skills to provide a safe, efficient flow of air traffic.
 - Three levels of difficulty for beginners to experts.
- Comprehensive manual includes tutorial on Principles of Air Traffic Control.
- Communications quick reference card.

Carefully engineered for the novice, yet will challenge the experts!

32K Machine Language. No Joysticks Required.
NOW ONLY \$29.95 DISK OR TAPE.

- NO DELAY for personal checks.
- Money Orders, COD's welcome.
- NO CHARGE postage, handling, COD's.
- N.Y.S. residents sales tax included

BETASOFT SYSTEMS

P.O. Box 1174 Smithtown, New York 11787 (516) 666-7240

Dealer Inquiries Invited



especially interested in flight simulators.

Could you give the names of some of the companies and their flight simulators? Again, your magazine is the best for my CoCo!

> Todd Witter Chicago, IL

Editor's Note: Check the August 1984 RAINBOW for the article "CoCo Takes Flying Lessons," Page 74. Also, Worlds of Flight, by Tom Mix Software (ad on Page 11, January 1985 RAINBOW).

BOUQUETS

Editor:

I want to say a word for Darren Croft of Color Connection Software. From a RAINBOW ad I ordered The Puzzler to use for my fifth grade class in Vinalhaven Island, Maine. It would not screen-dump the crossword puzzle to my Pro-writer. After notifying Color Connection, I immediately received a new disk to try and a kind apology from Darren Croft. The new disk worked fine. In 10 minutes 1 can type in 10-15 vocabulary words with definitions and get a marvelous printout of the puzzle, key and list of definitions to run off on the duplicator. It is an excellent device for teachers. I am more than pleased with the way the program works. And, I'm thoroughly pleased with Color Connection Software.

May I say that I find THE RAINBOW more useful in my profession than all the computer periodicals combined that are published for educators. I use five CoCos.

> Charles McCabe Lincoln School Vinalhaven, ME

A GOOD WORD FOR WORD-PAK

Editor:

After reading the January 1985 "Letters To Rainbow," it occurred to me that I couldn't recall anyone mentioning one of my favorite CoCo peripherals, the PBJ Word-Pak. I first learned of it at the 1984 Chicago RAINBOWfest (an exceptionally well-run and worthwhile convention). The Word-Pak plugs into the ROM-pack port and provides a true 80-column screen (naturally, this requires a monitor). It is really one fantastic product.

But that is only half of the story. PBJ's ads in THE RAINBOW emphasize the "PBJ support." This is no joke. I had a problem with my Word-Pak after I bought it. PBJ's Al Alberta patiently worked with me until it was resolved to my satisfaction. I am not only able to use Word-Pak with Radio Shack BASIC, but I also use it with OS-9, and I understand that there is also a driver

for FLEX.

I have noticed a few software companies selling programs that are written for use with Word-Pak. I hope this trend continues. Now if only my favorite word processor, Telewriter-64, would work with Word-Pak. How about it Cognitec? I would buy it in a minute!

Tim Feld West Allis, WI

BULLETIN BOARDS

Editor:

We here at The Great Gamma BBS would like to hear from other CoCo BBS SYSOPS to share ideas. You can either write or leave a message on our BBS at (804) 887-5302. Our address is 16 Embers Lane, 23185.

> George Marsh, Jr. Williamsburg, VA

Editor:

The Singing River Color Computer Club. Inc. is pleased to announce a new 24 hour BBS (601) 875-8688. SYSOP is Larry Corran. Current mailing address is SRCCC, Inc., 3605 Vancleave Road, #118, 39553. We will soon have a newsletter for download.

> Mark Welch Gautier, MS

Editor:

I would like to announce the new number of our TBBS bulletin board system (803) 776-8261. We operate at 300/1200 bps, 24 hours a day, seven days a week. Our SYSOP is Ed Sehlhorst.

> Tommy R. Sanders. Midlands 80 Computer Club Columbia, SC

Editor:

We are please to announce our BBS Colorama of Yonkers is now online seven days a week, 24 hours a day. Colorama BBS has downloads, boutique, want ads, magazine, graphics, E-mail, and other special features. (914) 965-7600.

Fred Siudym, SYSOP Yonkers, NY

Editor:

I am pleased to announce a new bulletin board system in Chandler. The CoCo Pub BBS is online 24 hours a day at (602) 899-1350 (voice) and 963-1931 (modem). Our theme is fantasy and science fiction. There is usually some kind of fantasy story being written by the users. We also like to hear reviews of science fiction books, movies, etc.

The CoCo Pub supports messages, downloads (text and programs), CoCo character graphics, bulletins and SYSOP

Chat.

Stephen Roberson Chandler, AZ Editor:

I would like to inform you of three bulletin boards currently running in the St. Joseph area.

1) Pony Express Systems (816) 232-2320. Online from 9 p.m. to 5 a.m. Mon.-Fri., Sat. and Sun. mornings online until 9 a.m. SYSOP is Rick Drozd.

2) Connection-80 (816) 279-6859, 24 hours, seven days a week. SYSOP is Logan

3) Info St. Joe (816) 233-2311. Online from 8 p.m. to 8 a.m. daily. SYSOP is Bill Van Vacter.

> Rick Drozd St. Joseph. MO

Editor:

The Color Information Center BBS of Dade County operates at 300 Baud and can be reached 24 hours a day at (305) 751-6809. The C.I.C. BBS runs on an 'E' revision circuit board, 64K modified Color Computer and Hayes 300 Smartmodem with an Epson MX-80/FT printer and three 51/4-inch disk drives running at 40 tracks and 6 ms. step rates for faster access. We feature three miniboards, public and private mail, a tropical storm/hurricane tracking program and much more.

Our system has been online for five months and we are listed in the XA-4 database of Compuserve's Color SIG.

> C.I.C. BBS Miami, FL

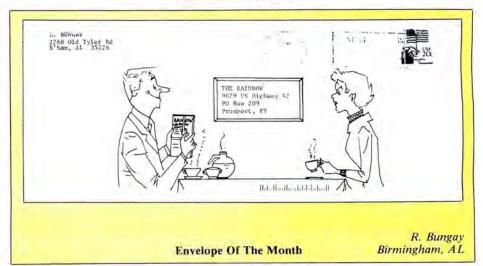
Editor:

I would like to announce a new BBS. Lakehurst Colorama is up and running 24 hours a day. Features include upload, download, message base, magazine section, scoreboard and more. (201) 657-0611.

Richard Bleil Lakehurst, NJ

The RAINBOW welcomes letters to the editors. Mail should be addressed to: Letters to Rainbow, Falsoft, Inc., 9529 U.S. Highway 42, P.O. Box 385, Prospect, KY 40059. Letters should include the writer's full name and address. Letters may be edited for purposes of clarity or space.

ARTS AND LETTERS



March 1985

SIGHT...



Combine the Color Computer 2 and the new



At \$219.95, Our Best Color Computer 2 Has a Lot of People Talking

Radio Shack's most powerful Color Computer 2 has always been a popular topic among computer enthusiasts. Our new low price of \$219.95—a savings of \$40—makes it an even hotter one. But now there's a new voice in the crowd, because our Color Computer 2 can speak for itself.

Get Sound and Speech for Just \$99.95

Add sound effects and up to three voices to your BASIC programs with our Sound/Speech Cartridge (26-3144, \$99.95). Put special sound effects in your personal game programs—or create your own stories and animated programs with the computerized voice of a narrator!

Our new cartridge is easy to use and plugs into your computer's Program Pak port or Multi-Pak Interface to add brand new challenges to your home programming. Simple PEEK and POKE commands let you access the Sound/Speech Cartridge for an almost endless number of exciting programming possibilities.

Get a Computer Designed for Serious Programmers

Our 64K Color Computer 2 was designed for the serious programmer—but it's easy enough to use for a beginner to learn on! It's the ideal choice for your family's first venture into computing or for upgrading your present "out-dated" home system for new challenges.

This is no kiddie computer: the 64K Color Computer 2 has enough power and room for expansion to

a sound.



Sound/Speech Cartridge and hear what you see

see you through high school, college and beyond. But we've made it easy to start home computing with the Color Computer 2 right away. Just connect it to your TV set and start programming in Extended BASIC (we include an easy-to-use manual to show you how), or choose from our ready-to-run software for games, educational programs and more.

The 64K Color Computer 2 makes it easy to create stunning color graphics with simple one-line commands. For even more challenge, try color animation—or create your own arcade-style games with music and sound effects.

For advanced programmers, the 64K Color Computer 2 can handle string arrays up to 255 characters, trigonometric functions and multicharacter variable names, full-featured editing and more.

The Color Computer 2's Extended BASIC also lets you access 32,000 characters of memory right away. Just add a disk drive and operating system and you'll have a full 64K to work with.

Expand Your Computer As Your Needs Grow

Your Color Computer can grow as your needs do. Add a disk drive and you can choose from our large selection of educational, entertainment and professional software. Or add a printer, plotter, modem, joysticks, Color Mouse and more for even greater versatility.

See the Color Computer and Accessories Today

Radio Shack makes it easy to start home computing with the Color Computer 2 and our new Sound/Speech Cartridge. Visit your nearby Radio Shack Computer Center or participating Radio Shack store or dealer today for a hands-on demonstration. Be sure to see all the Color Computer accessories while you're there.

Radio Shack The Technology Store

A DIVISION OF TANDY CORPORATION

i	New!	1985 (com	puter	Catalog	RSC-14.
	Send	me a	ree	сору.		

Mail To: Radio Shack, Dept. 85-A-348 300 One Tandy Center, Ft. Worth, TX 76102

Name ______Address _____

City _____

Telephone _____

Prices apply at Radio Shack Computer Centers and at participating Radio Shack stores and dealers. 64K Color Computer 2 (26-3127) was \$259.95 in Cat. RSC-12.



You will notice a slightly new look to THE RAINBOW this month. One of the changes is to make your reading and understanding a bit easier.

In most of the articles and tutorials, you will see the keywords and commands that you type into your CoCo in a different style of type — one that looks

a lot like the letters that actually appear on the screen.

This is the evolution of a process which began in the early days of THE RAINBOW when, using a dot matrix printer, we used quotation marks to make the commands look a little different. From there, still with the dot matrix printer, we experimented with condensed type and, finally, italic type.

Once we got into typesetting, after our first year, we continued using italic type; this was better because of the typeset quality. We continued that for some

time, always looking for something better.

Three months ago, after a lengthy search, we took delivery of a new typesetting system — a digital machine with a hard disk, three terminals, image previewing and other "bells and whistles." One of its specialties was the ability to use a large number of type styles at the same time, whereas before, we were limited to 16 at a time. From among these added possibilities, we chose the digital typeface to designate the commands you type into your computer.

So, now, we have something new. I have always believed the easier we make it to read THE RAINBOW, the better you can use it. This is a step in that direction.

We're taking other steps, too. You will notice some parts of the magazine have undergone what our art department calls a "redesign" in the past few months. Rather than make a big deal out of this, we are just doing it as we go along. The object, of course, is to make it easier for you to read and use THE RAINBOW. For example, you will see that our assembly and BASIC09 listings are done on a daisy wheel printer — because it makes them easier to read.

Look for more changes. And let me know your reaction to them. Some may be subtle, but we think they will help in your overall ability to use THE RAINBOW.

By the way, the change in the way we show commands on our pages will be incorporated in our other magazines, PCM and SOFT SECTOR, as well. Mention of PCM brings me to share some information on a major change in that publication which might be of interest to some of you.

Beginning with last month's issue PCM began coverage of the new Tandy 1000 and Tandy 1200 computers, as well as the Tandy 200 — the new portable. As many of you know, PCM heretofore covered the Tandy 2000 and the Model

100 portable. Of course, our coverage of those two machines continues.

Actually, the 200 is fully compatible with the 100 in BASIC — the language most of PCM's programs are written in, anyway. And the 1000 and 1200 — like the 2000 — are MS-DOS machines, which means much of the BASIC, all of the tutorials and many of the programs we run anyway will work on all three machines. So, we see this expansion as a logical step.

Moreover, we see the 1000, 1200, 2000, 100 and 200 as the "hot" Tandy machines of the latter half of the 1980s. I personally think the 1000 is going to be a "star" in the MS-DOS market. It is a heck of a bargain for the price! You

might want to check out PCM.

Over the last half year, I have written a couple of columns on specific subjects—one about the Apple Macintosh and another about the need of new software for the CoCo.

I said that I thought the Mac was an interesting machine, but that its concept was a little difficult to use for any real computing because of the necessity to "switch" back and forth between the mouse and the keyboard. At the time, though, I particularly praised the *MacPaint* graphics program.

On the subject of "new" software, I was talking about the need to develop new kinds of software for the CoCo. Interestingly, there is a new product out

for the CoCo that combines those two ideas.

It'll be difficult to miss the ad in THE RAINBOW from Colorware. But what

Telewriter-64 the Color Computer Word Processor

- 3 display formats: 51/64/85 columns × 24 lines
- True lower case characters
- User-friendly full-screen editor
- Right justification
- Easy hyphenation
- Drives any printer
- Embedded format and control codes
- Runs in 16K, 32K, or 64K
- Menu-driven disk and cassette I/O
- No hardware modifications required

THE ORIGINAL

Simply stated, Telewriter is the most powerful word processor you can buy for the TRS-80 Color Computer. The original Telewriter has received rave reviews in every major Color Computer and TRS-80 magazine, as well as enthusiastic praise from thousands of satisfied owners. And rightly so.

The standard Color Computer display of 32 characters by 16 lines without lower case is simply inadequate for serious word processing. The checkerboard letters and tiny lines give you no feel for how your writing looks or reads. Telewriter gives the Color Computer a 51 column by 24 line screen display with *true lower case characters*. So a Telewriter screen looks like a printed page, with a good chunk of text on screen at one time. In fact, more on screen text than you'd get with Apple II, Atari, TI, Vic or TRS-80 Model III.

On top of that, the sophisticated Telewriter full-screen editor is so simple to use, it makes writing fun. With single-letter mnemonic commands, and menu-driven I/O and formatting, Telewriter surpasses all others for user friendliness and pure power.

Telewriter's chain printing feature means that the size of your text is never limited by the amount of memory you have, and Telewriter's advanced cassette handler gives you a powerful word processor without the major additional cost of a disk.

...one of the best programs for the Color Computer I have seen...

- Color Computer News, Jan. 1982

TELEWRITER-64

But now we've added more power to Telewriter. Not just bells and whistles, but major features that give you total control over your writing. We call this new supercharged version Telewriter-64. For two reasons.

64K COMPATIBLE

Telewriter-64 runs fully in any Color Computer — 16K, 32K, or 64K, with or without Extended Basic, with disk or cassette or both. It automatically configures itself to take optimum advantage of all available memory. That means that when you upgrade your memory, the Telewriter-64 text buffer grows accordingly. In a 64K cassette based system, for example, you get about 40K of memory to store text. So you don't need disk or FLEX to put all your 64K to work immediately.

64 COLUMNS (AND 85!)

Besides the original 51 column screen, Telewriter-64 now gives you 2 additional high-density displays: 64×24 and $85 \times 24!!$ Both high density modes provide all the standard Telewriter editing capabilities, and you can switch instantly to any of the 3 formats with a single control key command.

The 51×24 display is clear and crisp on the screen. The two high density modes are more crowded and less easily readable, but they are perfect for showing you the exact layout of your printed page, all on the screen at one time. Compare this with cumbersome "windows" that show you only fragments at a time and don't even allow editing.

RIGHT JUSTIFICATION & HYPHENATION

One outstanding advantage of the full-width screen display is that you can now set the screen width to match the width of your printed page, so that "what you see is what you get." This makes exact alignment of columns possible and it makes hyphenation simple.

Since short lines are the reason for the large spaces often found in standard right justified text, and since hyphenation is the most effective way to eliminate short lines, Telewriter-64 can now promise you some of the best looking right justification you can get on the Color Computer.

FEATURES & SPECIFICATIONS:

Printing and formatting: Drives any printer (LPVII/VIII, DMP-100/200, Epson, Okidata, Centronics, NEC, C. Itoh, Smith-Corona, Terminet, etc).

Embedded control codes give full dynamic access to intelligent printer features like: underlining, subscript, superscript, variable font and type size, dotgraphics, etc.

Dynamic (embedded) format controls for: top, bottom, and left margins; line length, lines per page, line spacing, new page, change page numbering, conditional new page, enable/disable justification.

Menu-driven control of these parameters, as well as: pause at page bottom, page numbering, baud rate (so you can run your printer at top speed), and Epson font. "Typewriter" feature sends typed lines directly to your printer, and Direct mode sends control codes right from the keyboard. Special Epson driver simplifies use with MX-80.

Supports single and multi-line headers and automatic centering. Print or save all or any section of the text buffer. Chain print any number of files from cassette or disk.

RAINBOW

File and I/O Features: ASCII format files — create and edit BASIC, Assembly, Pascal, and C programs, Smart Terminal files (for uploading or downloading), even text files from other word processors. Compatible with spelling checkers (like Spell 'n Fix).

Cassette verify command for sure saves. Cassette autoretry means you type a load command only once no matter where you are in the tape.

Read in, save, partial save, and append files with disk and/or cassette. For disk: print directory with free space to screen or printer, kill and rename files, set default drive. Easily customized to the number of drives in the system.

Editing features: Fast, full-screen editor with wordwrap, block copy, block move, block delete, line delete, global search and replace (or delete), wild card search, fast auto-repeat cursor, fast scrolling, cursor up, down, right, left, begin line, end line, top of text, bottom of text; page forward, page backward, align text, tabs, choice of buff or green background, complete error protection, line counter, word counter, space left, current file name, default drive in effect, set line length on screen.

Insert or delete text anywhere on the screen without changing "modes." This fast "free-form" editor provides maximum ease of use. Everything you do appears immediately on the screen in front of you. Commands require only a single key or a single key plus CLEAR.

...truly a state of the art word processor...
outstanding in every respect.

- The RAINBOW, Jan. 1982

PROFESSIONAL WORD PROCESSING

You can no longer afford to be without the power and efficiency word processing brings to everything you write. The TRS-80 Color Computer is the lowest priced micro with the capability for serious word processing. And only Telewriter-64 fully unleashes that capability.

Telewriter-64 costs \$49.95 on cassette, \$59.95 on disk, and comes complete with over 70 pages of well-written documentation. (The step-by-step tutorial will have your writing with Telewriter-64 in a matter of minutes.)

To order, send check or money order to:

Cognitec 704 Nob Street Del Mar, CA 92014

Or check your local software store. If you have questions, or would like to order by Visa or Mastercard, call us at (619) 755-1258 (weekdays, 8AM-4PM PST). Dealer inquiries invited.

(Add \$2 for shipping. Californians add 6% state tax.

Now available at Radio shack stores via express order

Apple II is a trademark of Apple Computer, Inc.; Atari is a trademark of Atari, Inc.; TRS-80 is a trademark of Tandy Corp; MX-80 is a trademark of Epson America, Inc.



triad pictures corp.

box 1299 segum, wa 98382

THE ANIMATOR SERIES

Create your own FULLY ANIMATED CARTOONS!

"THE ANIMATOR certainly is a one-of-a-kind package: I've never seen something like this on any other home computer .. a very good buy for the CoCo." - Ed Ellers, RAINBOW Technical Writer

READ THE REVIEW IN JANUARY'S RAINBOW

THE ANIMATOR - Command a Hollywood style animation studio. 32 cels & 620 frames for over 1.5 min. of animation! Extensive manual & 3 cassettes. 32K/EXT. CASS. \$35

ANIMATOR COMMERCIAL (for professional use) - 12 FULL-SCREEN cels stored in upper 32K. Can be called from BASIC. Variable-speed SCROLL (any direction)! TEXT! Hires & "block" versions. Up to 3 min. & 20 frames/sec.

64K/EXT, CASS, \$50

ANIMATOR JR. - a simplified version in semigraphics. 16 cels, 500 frames (1.5 min. +). Animation can be called from your own BASIC program!

ROBOT BASIC

Kids 7 & up can write graphics programs! Program an imaginary robot to draw graphics. CLONE multiple robots: TEACH the robot your own commands! Develops problem-solving skills; makes math & geometric concepts come alive! Doodle Mode for easy experimentation. 16 & 32K/EXT. CASS. \$18

THE TRIAD PRESCHOOL SERIES

Used in hundreds of preschools & day-care centers

CENTIPEDE ABC's & 123's

Children 3 & up learn letters & numbers. Each correct response adds another animated part to a smiling, dancing 16K/EXT. CASS. \$18

ALPHABET STEW

KEYBOARD EXPLORATION FUN. Children 18 months & up can command the computer. Up to 70 different animated 16 & 32K/EXT. CASS. \$18

ETCH * A * DOT

Easy drawing program for children 4 & up. Block-graphics (semigraphics). 16K/EXT, CASS, \$12

PRESCHOOLS: CALL (206) 683-6459 OR SEND PURCHASE ORDER. GENEROUS VOLUME DISCOUNTS AVAILABLE.

C.O.D. PHONE ORDERS OK.

			\$
			\$
			\$
Add \$2 SHIPPING AN	D HAND	LING	\$
		LIIIG	· · · · •
(3 or more - we)			TOTAL \$
(3 or more - we p			TOTAL \$TRIAD PICTURES

we have is a *MacPaint*-type program running on the CoCo. It appears to combine the best of two systems in a very nice package.

This is the kind of innovation that will keep the CoCo market a healthy one. For those of you in the software business — or interested in getting into it — look at new ideas, not old ones. After all, that's what using computers is really all about — innovation.

Finally, another short story. Obviously, we have a huge number of computers here, and one of the big problems is in keeping the screens clean. While out eating the other night, the restaurant gave me something called a "Wet-Nap" to clean my hands. I asked for another, took it back to the office, and cleaned a screen with it.

It worked really well. Got a lot of dirt, grit and junk off the screen. And, it wasn't so wet that it "ran" down the screen and into the monitor. So, I asked Marianne Booth to call the company and order a few hundred of them for everyone here.

The company will sell to anyone, but their minimum is 10,000. That's a lot of dirty screens. I figure we have enough to clean every computer screen here well past "The Year We Make Contact — 2010."

Lonnie Falk

GOLDKEYS

Keyboard Enhancement for the 64K Color Computer

GOLDKEYS is a machine-language program which adds these powerful new keyboard features to your 64K Color Computer:

TEN (10) USER-DEFINABLE FUNCTION KEYS • TYPE-AHEAD BUFFER • NON-DESTRUCTIVE CURSOR • INPUT EDITOR • AUTO-REPEAT KEYS • ENHANCED EDITING • KEY CLICK • LAST COMMAND RECALL • BREAK KEY ON/OFF CONTROL • ON BREAK GOTO • ON RESET GOTO • CONTROLLABLE BASIC INPUT ROUTINE • COMMAND TO SAVE FUNCTION KEYS

GOLDKEYS requires a minimum 64K Extended Color BASIC, and is compatible with all current ROM revisions. GOLDKEYS is also compatible with all currently available keyboards and supports their dedicated Function keys.

CASSETTE......\$2000 DISKETTE.

LOWEST PRICES

VIDTRON also offers highest quality, lowest priced Hardware and Software for the Color Computer. Please see our December Ad or write for our FREE catalog for details:

HARDWARE—ROMs, RAMs, I.C.s, Solderless Kits, Serial Switchers, RAM Buttons, DINs, Heat Sinks and more. SOFTWARE—EDITTRON, LISTER, CROSSREF, VAR-DUMP, COMPRESS, GARBAGE, HI-BASIC, PM4PRINT, ROM-BOOT, SOFT-VID, NEWLLIST and more.

TERMS: Send a cashier's check or money order for immediate delivery ● For personal checks, allow 2 weeks ● California residents add 6% ● Orders under \$25 add \$2 shipping







YOU COULD FALL IN LOVE WITH

AUTOTERM!

IT TURNS YOUR COLOR COMPUTER INTO THE

WORLD'S SMARTEST TERMINAL

AND MOST LOVABLE

GOOD LOOKIN'

AUTOTERM shows true upper/ lower case in screen widths of 32, 40, 42, 51, or 64 characters with no split words. The width of 32 has extra large letters. Scrolling is forward, backward, and fast. Block graphics pictures are displayed automatically and can be scrolled.

The screen's top line shows operating mode, unused memory size, memory on/off, and capslock on/off. It also gives helpful prompts.

SWEET TALKIN'

KEY-BEEP can be on/off. Unacceptable keystrokes cause a lower pitched BOP! This ERROR-BEEBOP can be on/off.

Talks to other computers with Full or Half Duplex; Baud Rate of 110, 150, 300, 600, 1200; Parity as even, odd, mark, space, none; 7 or 8 bit Word; any Stop Bits; all 128 ASCII characters; true line Break; XON/XOFF protocol; and optional line-at-a-time transmission. Able to send and receive text, block graphics, BASIC and ML programs. A 64K machine holds up to 46,600 characters (34,900 in HI-RES).

DUAL PROCESSING lets you review & edit while more data is coming in.

Fully supports D.C. Hayes and other intelligent modems.

Talks to your printer with any page size, margins, line spacing, split word avoidance. Embed your printer's control sequences for boldface, underlining, etc. Narrow text can be automatically spread out.

You'll also use Autoterm for simple word processing and record keeping

You can display directories, delete files, transmit directly from disk, and work with files larger than memory. Easily maintain a disk copy of an entire session.

Compatible with TELEWRITER (ASCII) & other word processors.

SMOOTH WALKIN'

AUTOTERM moves smoothly and quickly between word processing and intelligent terminal action. Create text, correct your typing errors; then connect to the other computer, upload your text, download information, file it, and sign-off; then edit the received data, print it in an attractive format, and/or save it on file.

Editing is super simple with the cursor. Find strings instantly, too! Any operating parameter, such as screen width, can be altered at any time. Uncompleted commands can be cancelled.

PUTTY IN YOUR HANDS

The word processor can be used to create, print, and/or save on file your personal KSMs. They let AUTOTERM act like you. For example, it can dial through your modem, sign-on, interact, perform file operations, & sign-off; an entire session without your help. KSMs can answer the phone, prompt the caller, take messages, save them, hang-up, and wait for the next call. The KSM potential is unbelievable!

NO OTHER COMPUTER IN THE WORLD CAN MATCH YOUR COCO'S AUTOMATIC TERMINAL CAPABILITIES!!!

WHAT THE REVIEWERS SAY

"AUTOTERM is the Best of Class."
Graham, RAINBOW, 6/83

"The AUTOTERM buffer system is the most sophisticated — and one of the easiest to use..."

Banta, HOT CoCo, 9/84

"Almost a full featured word processor..."
Ellers, RAINBOW, 11/84

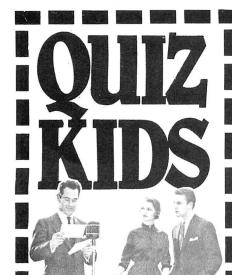
RECOMMEND 32K to 64K Tape-to-Disk Upgrade \$23 You Keep the Cassette

CASSETTE \$39.95 DISKETTE \$49.95

Add \$3 shipping and handling MC/VISA/C.O.D.

PXE Computing 11 Vicksburg Lane Richardson, Texas 75080 214/699-7273

Please hire the mentally retarded. They are sincere, hard working and appreciative. *Thanks! Phyllis*.



LOGO SHAPES--\$14.95 LOGO STARS—\$14.95 Both programs on one cassette-\$22.50

Everybody's talking about the QUIZ KIDS, the two quiz programs written in Color LOGO. Prepare your child to move from LOGO to BASIC by learning to type responses to the

computer's questions. Each quiz includes Study and Practice sessions, a Test, and a Reward for a passing grade. LOGO SHAPES uses simple shapes, such as circles and squares. LOGO STARS displays five constellations from the northern sky and is an exciting introduction to the stars. (Requires Color Logo)

BUT IF YOU DON'T KNOW LOGO Send for our LOGO STARTER program...

Teachers agree: LOGO is the best way to introduce children to computers. Now, with LOGO STARTER you won't have to read a book or instruction manual. Just load the LOGO **STARTER** tape. Your child will draw exciting designs right from the start. You won't waste your time on a lot of tedious typing. And your child will be on the way to computer literacy. (Requires Radio Shack Color LOGO) \$13.95

SPEED READING \$17.95

Busy executives! Students! Increase reading speed dramatically. Best available speed reading program for the CoCo. Reading material appears on the TV screen at the speed you select, training you to read faster. You can even change speed while reading. Complete with 6 different text selections and a quiz for comprehension, plus a drill to improve visual span & perception.

WILD PARTY—\$27.95

A naughty, sexy computer game for 2 to 6 couples. (Write us-we'll send a copy of the Review.)

"Would definitely liven up most parties." -Rainbow Magazina

All programs on cassette tape for 16K Color Computer. Extended BASIC not required. Prices include postage (PA residents add 6%). Send check to P.O. Box 210, Jenkintown, PA 19046

BUILDING MARCH'S RAINBOW

A Magazine's Heart is Its Printer . . . Comments on Dot Matrix and Daisy Wheel . . . And, Announcing a New Typography Style . . .

ne of THE RAINBOW's stalwart veterans made a quiet, unceremonious exit a few weeks ago. As I reflect on it, I'm glad I wasn't present when the old workhorse's harness was slipped off and she was sent out to pasture in favor of a prancing new colt which promises to run twice as fast and with more grace and style than the old lady was ever able to muster up. Yes, I'm glad someone less sentimental than me pulled the plug on our Epson MX-80 F/T.

Call it maudlin if you will, but I'm the sort who finds it difficult to say goodbye to the old family car when trading time comes around. The same thing goes for anything else which through time and experience I've grown to know and trust. Give me old boots, old jeans, old dogs and old machines. No, we didn't have a pet name for the old Epson, but she was a trusted friend and, from the day she arrived, was used to print virtually every listing appearing in THE RAINBOW until her retirement. Her record of service was unblemished and I'd gladly provide a testimonial if she should be nominated for the dot matrix hall of fame.

Well, the new printer is also an Epson — the Epson FX-80 — and it already shows bright promise. But, until it proves itself, it's still an "it" and has no staunch advocate. So, this means we're in a period in which we can challenge the Epson's territory. Toward that end, you may have noticed that our machine language listings are now being done with one of our daisy wheel printers. We think it's such an improvement that now we're considering doing all of our listings on a daisy wheel printer. This clearer "correspondence quality" printing becomes even more important if we elect to go to three-column listings, such as the trial balloon listing on pages 44 through 53. But, then, it should also tidy up things even if used with our present two-column format (compare pages 80 and 81). What do you think?

Why have we stuck with the dot matrix printouts? Well, we feel it's what most of our readers are accustomed to seeing since the majority of you who have printers have the dot matrix type. We believe using a familiar type style enhances readability and helps you when you're comparing your printout to ours. It's the same sort of logic we follow in making our listings 32 characters wide — the same width the lines appear on the screen; it facilitates comparison of your listing to ours. In fact, many clever readers print out their freshlytyped-in listings at a 32-character line width and then overlay their printout right on top of THE RAINBOW page, a very handy way to spot differences when debugging!

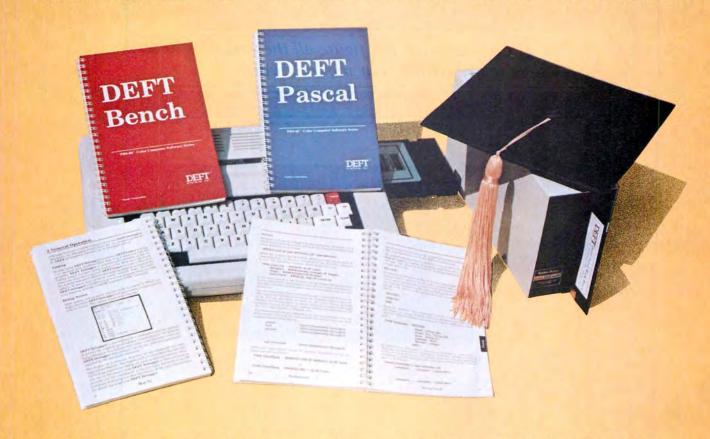
Clearly, though, daisy wheel printouts improve the overall appearance of the magazine and, since they have much better definition, may be easier on the eyes, too. Perhaps we should retire the new Epson before the new even wears off. Maybe we'll experiment around a bit and get your reaction.

Along these same lines, we hope you like our new "digital" font we're using in the text of articles whenever BASIC command words, such as CLOAD, LIST and GDSUB, are used. We think it's helpful — especially to beginners for us to set these words apart, and we feel the digital type style does this with less distraction than our previous practice of putting BASIC commands in all capitals and italics (for example, LLIST). We hope you agree it gives a better "flow" to the text lines. Enhancing readability is what it's all about.

Since this is our business and finance issue, here's an investment tip: Enter a year's subscription to THE RAINBOW and you'll save both time and money, and enhance readability, too, by ensuring that each month there's a RAINBOW with your name on it.

— Jim Reed

Graduate With DEFT Pascal



As a result of the programming language requirement of the Advanced Placement (AP) Tests, Pascal has become the standard language used in High Schools and Colleges today. On the Color Computer, DEFT Pascal is the standard.

DEFT Bench \$49.95

DEFT Edit

Full screen editor

DEFT Linker (see DEFT Pascal)

DEFT Lib

inquiries welcome.

create and maintain program object libraries

DEFT Debugger

debug Pascal machine programs symbolically

DEFT Macro/6809

supports entire 6809 instruction set, lets you define your own

instructions

ROM independent and use all of the memory in your Color Computer without OS-9. All you need is DEFT software and a TRS-80 Color Computer with Extended Disk BASIC, at least 32K of RAM and One Disk Drive. With DEFT Pascal (\$79.95) you will also need a text editor to write your programs. Software licensing arrangements are available for schools. Dealer

RS# 90-5001

All DEFT software and programs developed with DEFT software are BASIC

DEFT Pascal \$79.95

DEFT Pascal Compiler DEFT Linker

complete Pascal language, generates machine language object

combines multiple program objects into one binary

program

RS# 90-5000

DEFT Pascal Workbench \$119.95 (DEFT Pascal And DEFT Bench Together)

RS# 90-5002



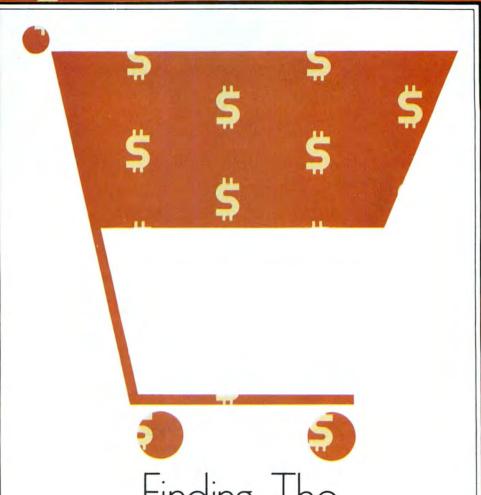
Now Available
By Express Order
At Your Local
Radio Jhack Store!

Orders and Sales Information 1-800-992-DEFT Technical Assistance 1-301-253-1300

DEFT is a Trademark of DEFT Systems, Inc. TRS-80 is a Trademark of TANDY Corporation

_ DEFT Pascal Workbench	Suite 4, Damascus Centre
Method of Payment (check one) ☐ Check Enclosed ☐ VISA ☐ Master Card ☐ COD	Damascus, MD 20872
Account Number	
Card Expiration Date / /	
Signature	
Name	
Street	
City	_ State _ Zip
All orders are shipped UPS within 24 hours of receipt. Acresidents add 5% for State Sales Tax; add \$2.00 for CO	

EOQ Calc can help you figure all the variables to see if you're really getting your money's worth



Finding The Ultimate Bargain

By Paul Myers

he following program is an example of an operational research (also known as scientific management) technique. Its purpose is to identify the most economic quantity for any type of stock that is relatively steady in its consumption,

(Paul Myers is a programmer/analyst for Technicon Corp. His nine years of data processing experience include working with both large scale and mini-computer systems.)

While your money is tied up in stock, it can't be earning interest in a bank. That's costing you money you could be making. There is a cost involved with keeping up a building, usually referred to as overhead. If you didn't need to store products, you would require less space. Therefore, you would be able to get by with a smaller building, which would probably cost you less money to maintain.

The Stock Holding Cost in this formula represents a percentage of these upkeep costs that each product must bear. Generally speaking, this figure will fall somewhere between 10 to 50 percent. This would depend on what proportion of the building is used to store materials.

Using the Program

The following keys are available for your use.

Up-Arrow Down-Arrow Left-Arrow ENTER Key @ Key

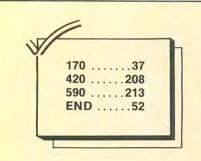
After you have CLOADed the program, type RUN and press ENTER. A question mark will appear in the left-hand side of the field where the next input will be placed. After you have pressed the proper numbers, pressing the ENTER key will accept the value and move you to the next field.

If you make a mistake while entering a number, press the left-arrow and it will clear what has been typed. If you wish to skip up or down without changing the value at the current position, use the corresponding arrow key. When you are ready to perform the calculation, press the '@' key. The values will remain as you selected them after the calculation is complete. This will allow you to experiment with changing one field or another without needing to retype all of the values again. Also, EOQ Calc will not allow you to calculate if any of the values are zero.

One final note about the program. I did not wish to use the SQR (square root) function since it is not available on a 4K system. For those of you who do have a system with Extended BASIC, you may wish to replace lines 590 through 650 with

590 EO=INT(SQR(OW)*10+.5)/10

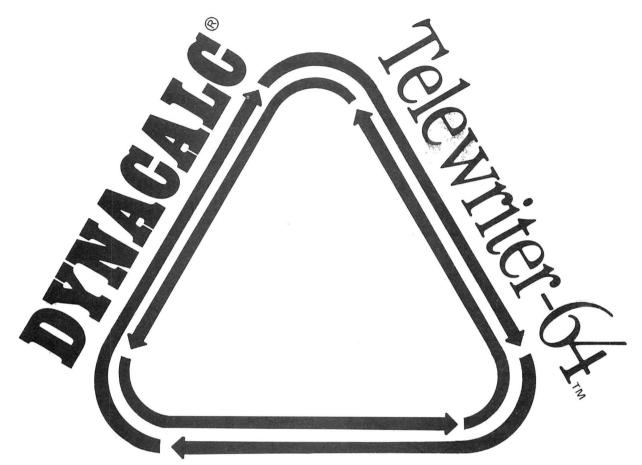
This should help speed up the calculation function.



The listing:

```
'E.O.Q. CALCULATOR
10
20 'BY PAUL MYERS 1984
30 FOR X=1024 TO 1279
40 POKE X,128:POKE 1535-(X-1024)
,128
50 NEXT X:B$=CHR$(128):C$=CHR$(1
30)
60 PRINT@5, "economic"+B$+"order"
+B$+"quantity";
70 PRINT@44, "calculator";
80 PRINT@97, "annual "+B$+"usage";
90 PRINT@129, "unit"+B$+"cost";
100 PRINT@161, "order"+B$+"overhe
ad"+B$+"cost";
110 PRINT@194, "includes"+B$+"cos
t"+B$+"of"+B$+"handling";
120 PRINT@226, "paper"+B$+"work"+
C$+B$+"shipping"+B$+"charges"+C$
130 PRINT@258, "and"+B$+"delivery
"+B$+"handling";
```

```
140 FRINT@289, "stock"+B$+"holdin
q"+B$+"cost";
150 PRINT@322, "includes"+B$+"cos
t"+B$+"of"+B$+"tying"+B$+"up";
160 PRINT@354, "capital"+B$+"in"+
B$+"stock"+C$+B$+"and"+B$+"stora
ge";
170 PRINT@386, "costs"+B$+" (perce
ntage)";
180 PRINT@449, "e"+B$+"o"+B$+"q";
190 PRINT@118,"
                         11 :
200 PRINT@150,"
210 PRINT@182,"
220 PRINT@310,"
230 P=118:GOSUB 700
240 IF I$<>CHR$(13) THEN WO$=STR
$ (AU)
250 AU=INT(VAL(WO$)+.5)
260 X=9-LEN(STR$(AU))
270 FOR Z=0 TO X:PRINT@118+Z,CHR
$(143); NEXT Z
280 PRINT@118+Z-1,AU;:PRINT@127,
B$:
290 IF I$=CHR$(94) THEN 490
300 IF I$="@" THEN 580
310 P=150:GOSUB 700
320 IF I$<>CHR$(13) THEN WO$=STR
$(UC)
330 UC=INT(VAL(WO$)*100+.5)/100
340 X=9-LEN(STR$(UC))
350 FOR Z=0 TO X:PRINT@150+Z,CHR
$ (143) : NEXT Z
360 PRINT@150+Z-1,UC;:PRINT@159,
370 PRINT@150,"$";
```



Pro-Color-Series™

THE LOGICAL CHOICES

DYNAGALG®

42 Four Seasons Center #122 Chesterfield, MO 63017 Ph: 314/576-5020

Telewriter-64...

COGNITEC 704 NOB ST. DEL MAR, CA 92014 (619) 755-1258

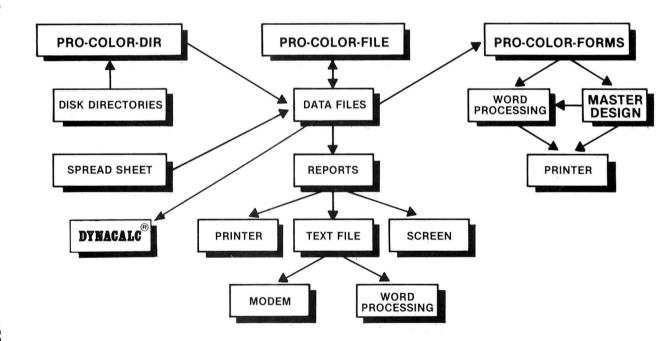
Pro-Color-Series™

DERRINGER SOFTWARE, INC. PO BOX 5300 FLORENCE, SC 29502-2300 (803) 665-5676

OTALLY NTEGRATED ACKAGE

After two years on the market, we've orchestrated our software to perform for you in ways other programs can't even play second fiddle to.

The all new **Pro-Color-Series**™ offers total integration between its advanced database functions, word processing, spread sheet, graphics and communications.



PRO-COLOR-FILE will listen to your spread program and create data files that can be reported and sorted even further.

PRO-COLOR-FORMS will take data from PRO-COLOR-FILE and merge it with a letter for bulk mailings. It will even merge hi-res graphics from MASTER DESIGN for placement within a letter or form. It will send reports to a printer, screen or an ASCII text file that can then be transmitted by your communications program or read by your word processor.

N. Sylverysic

Pro-Color-Series M

© 1984 by Derringer Software, Inc.

Now there's a series of programs that offers integration between the five major uses of a computer — Database, Word Processing, Spread Sheet, Communications and Graphics!

PRO-COLOR FILE *Enhanced* 2.0 \$59.95

An all new version of PRO-COLOR-FILE will once again leave its mark as the most flexible database in its price range for the Color Computer.

• 60 Data Fields • 1020 BYTE RECORDS • TRUE MULTI DRIVE SUPPORT • 4000 + RECORD CAPACITY • 4 USER DEFINED DATA ENTRY SCREENS • 28 MATH EQUATIONS • IF-THEN-ELSE FUNCTIONS IN EQUATIONS • FILE-WIDE RECALCULATION • 8 USER DEFINED REPORT FORMATS • 6 USER DEFINED LABEL FORMATS • TOTAL FIELDS ON REPORTS • SUMMARIZE FIELDS • SEND REPORTS TO PRINTER, SCREEN OR TEXT FILE • FAST ML SORT (750 RECORDS IN LESS THAN 5 MINUTES) • CREATE UP TO 16 INDEXES FOR SORTING OR REPORTING RECORDS • AUTO KEY REPEAT • KEYBOARD CLICK • STORES FORMATS FOR REPEATED USE • CUSTOM SELECTION MENUS • PASSWORD PROTECTION • CREATES FILES COMPATIBLE WITH DYNACALC®

Because of PRO-COLOR-FILES ability to send reports to a text file, this means you can use your favorite communications program to transmit reports to other computers or read them in with your favorite word processor for creating customized reports. You can also convert ASCII files from your favorite spread sheet program into data files that can be accessed for further reporting and analyzing. PRO-COLOR-FILE is also supported by the PRO-COLOR-FILE National Users Group with quarterly newsletters. Join the rest of the world and discover for yourself what you've been missing.

MASTER DESIGN

\$29.95

This graphics program does more for you than just hi-res graphic editing. It will generate lettering in hi-res graphics that can be different sizes, skinny, bold, textured, drop shadowed, raise shadowed or tall. It will also interface with the Telewriter-64 word processor for printing hi-res displays with your letters.

As a graphics editor, it takes full advantage of all the extended BASIC hires graphic commands. Create boxes, circles, lines, copy displays and utilize GET and PUT features. Some added commands include mirror reflection, turn displays backwards or upside down, Squish displays, create dot patterns for shading or diagonal lines for creative backgrounds.

Special text files created with the Letter Head Utility allow you to access hi-res graphics from Telewriter-64, your own BASIC programs or PRO-COLOR-FORMS.

MASTER DESIGN comes with its own screen dump routine which interfaces with all popular dot matrix printers that have dot addressable graphic ability.

See reviews in:

July '84 Rainbow, Oct. '84 Hot CoCo Telewriter-64 © 1983 by Cognitec

PRO-COLOR-DIR

\$21 95

Need to organize all your diskettes so you know where each program is? PRO-COLOR-DIR will read your directories and create a master data file that can be accessed by PRO-COLOR-FILE for sorting and reporting. 1000 + records can be stored on one diskette with valuable information about each program.

• DISK ID NAME • FILENAME/EXT • TYPE OF FILE • DATE CREATED • DATE UPDATED • NUMBER OF GRANS ALLOCATED • NUMBER OF SECTORS ALLOCATED AND USED • MACHINE LANGUAGE ADDRESSES •

A diskettes directory can be re-stored in the data file with old entries deleted and new ones appended automatically. You can obtain hard copies of the information and create labels of the filenames for placing on the diskette itself.

PRO-COLOR-FORMS 2

\$29.95

PRO-COLOR-FORMS will access data files you create with PRO-COLOR-FILE and merge them with a letter or place them on pre-printed forms such as statements. Any field of information from your data file can be placed anywhere and repeated as many times in the letter or on the form. You can use the built in ML text editor for creating the form or use your favorite word processor.

• DESIGN UP TO 6 FORMATS AT ONE TIME • USER DEFINED PAGE SIZE • SUPPORTS SPECIAL PRINTER CONTROL CODES • RIGHT JUSTIFICA-TION • PASSWORD PROTECTION • MERGES WITH GRAPHICS FROM MASTER DESIGN •

If you use our graphics program MASTER DESIGN, you can merge graphics with your forms for added enhancements. Have your graphic letter head printed at the top of each letter or incorporate designs, bar graphs or any display created within the form itself.

Buy any 3 and deduct 10% — Buy all 4 and deduct 15%

Shipping: Include \$3.00 for UPS shipping, \$6.00 postal, \$12.00 overseas Send orders to: Derringer Software, Inc. P.O. Box 5300, Florence, SC 29502-2300 VISA/MasterCard customers call: (803) 665-5676 10:00 am to 5:00 pm EDT

DYNACALC

THE BEST SPREAD SHEET PROGRAM ON THE MARKET* \$99.95 (Includes DYNAGRAPH©) \$89.95 IF PURCHASED WITH ANY OF THE ABOVE PROGRAMS.



Use your computer to improve your performance at the track! These 16K programs for Thoroughbred, Harness and Greyhound racing let you rank the horses or dogs in each race quickly and easily, even if you've never handicapped before! All the information you need is readily available from the Racing form, thoroughbred or dog track program. We even provide a diagram showing you where to get the information you need.

Thoroughbred factors include speed, distance, past performance, weight, class, jockey's record, beaten favorite and post position. Harness factors include speed, post position, driver's record, breaking tendencies, class, parked-out signs and beaten favorite. Greyhound factors include speed, past performance, maneuvering ability, favorite box, class, kennel record, beaten favorite and breaking ability.

Data entry is quick and easy. You can handicap a race in minutes! Complete instructions and wagering guide also tell you which races to bet and which to avoid-one of the real secrets of good handicapping. Thoroughbred, Harness and Greyhound Handicappers sold separately at \$34.95 each on tape or disk. Order any two for \$54.95 or all three for \$74.95.

Learn French! Learn Spanish!

These beautiful 16K Ext. programs will teach you and your children a basic French or Spanish vocabulary. Each language package comes with two programs containing 1,000 vocabulary words in a fun-to-run game format that teaches youngsters to think as well as memorize. They'll be delighted as the letters hop across the screen and fall into place. Plenty of positive reinforcement, too. Great for beginners of any age! A full vocabulary listing for lesson plans and study guides makes these programs perfect for home or classroom. French or Spanish package, only \$24.95 on tape, \$27.95 on disk. Both packages only \$39.95, tape or disk.



Federal Hill Software 825 William Street Baltimore, Md. 21230



760 GOTO 710

Toll Free (Orders Only) 800-245-6228 For Information Call 301-685-6254

380 IF I = CHR + (94) THEN 230 390 IF I\$="@" THEN 580 400 P=182:GOSUB 700 410 IF I\$<>CHR\$(13) THEN WO\$=STR 420 OC=INT(VAL(WO\$)*100+.5)/100 430 X=9-LEN(STR\$(OC)) 440 FOR Z=0 TO X:PRINT@182+Z,CHR \$(143)::NEXT Z 450 PRINT@182+Z-1,OC::PRINT@191, 460 PRINT@182,"\$"; 470 IF I\$=CHR\$(94) THEN 310 480 IF I\$="@" THEN 580 490 P=310:GOSUB 700 500 IF I\$<>CHR\$(13) THEN WO\$=STR \$ (HC) 510 HC=INT(VAL(WO\$)*10+.5)/10 520 X=9-LEN(STR\$(HC)) 530 FOR Z=0 TO X:PRINT@310+Z,CHR \$(143);:NEXT Z 540 PRINT@310+Z-1, HC; : PRINT@319, 550 PRINT@310,"%": 560 IF I = CHR = (94) THEN 400 570 IF I = CHR = (10) OR I = CHR = (13) THEN 230 580 IF HC=0 OR UC=0 OR AU=0 OR O C=0 THEN 230 ELSE OW=(2*AU*OC)/((HC/100) *UC) 590 X=1 600 IF X*X<OW THEN X=X+1:GOTO 60 610 X=X-1 620 IF X*X<OW THEN X=X+.1:GOTO 6 630 X=X-.1 640 IF X*X<OW THEN X=X+.01:GOTO 650 X=X-.01:E0=INT(X*10+.5)/10 660 X=9-LEN(STR\$(ED)) 670 FOR Z=0 TO X:PRINT@470+Z,CHR \$(128);:NEXT Z 680 PRINT@470+Z-1,ED;:PRINT@479, B\$: 690 GOTO 230 700 WO\$="":PRINT@P,"?"; 710 I\$=INKEY\$: IF I\$="" THEN 710 720 IF I\$=CHR\$(64) OR I\$=CHR\$(13) OR I\$=CHR\$(94) OR I\$=CHR\$(10) THEN RETURN 730 IF I\$=CHR\$(8) THEN PRINT@P," ";:GOTO 700 740 IF I\$<CHR\$(46) OR I\$>CHR\$(57) THEN 710 750 WD\$=WD\$+I\$:PRINT@P,WD\$;:H\$=I

Direct a Symphony on Your Color Computer



with VIP Integrated Library™

VIP Desktop Magic!

Finally, you can have the power and integration of Lotus Symphony¹¹, 1 2 3¹¹ or Open Access¹¹ for the larger micros on your Color Computer! The convenience of instant changes to a new application and effortless transfer of files is at the tip of your finger.

With VIP Desktop, the six applications of VIP Library are integrated into one program, on one disk. You have instant access to word processing, with a spelling checker always in attendance, data management with mail merge, spreadsheet financial analysis, telecommunications and disk maintenance. Just move the hand to point to the volume, and the new application is there. And VIP Integrated Library has been made to work well with one disk drive, or all four, so be ready to push your Color Computer to the limits!

Available By Express Order At Your Local Radio Jhack Store!

Radio Shack Catalog No. 90-0213

Ask to see the demonstration diskette.

Radio Shack is a registered trademark of Landy Corp. Landy 2000 is a trademark of Landy Corp. Symphony and 1.2.3 are trademarks of Lotus Corp. Open Access is a trademark of Software Products International "...PICTURE getting your instantaneous investment report with your modem, using it in a spreadsheet calculation, making a report, and writing a memo including that report and data from your database with your word processor - all this power without leaving VIP Desktop! . . ."

Elegance!

VIP Integrated Library is a product with finesse, inside and out. Inside is one awesome but very elegant program. On the outside, it comes handsomely bound in two cloth covered, gold embossed binders with slipcases - like those you get with software for the Tandy 2000." And remember, to get software of this quality for the Tandy 2000 you would have to pay hundreds more!

Buy the Integrated Library for

\$149.95

Or buy the individual volumes separately, as shown on the following pages!†

Requires 64K and one or more disk drives.

VIP Integrated Library comes on one disk. Tape versions of programs are not supplied.

Stand-Alone Power

VIP Integrated Library is not one of those slip-shod, all-in-one slicer-dicer machines, good for one day and then you throw it away. It fully integrates the six top-of-the-line stand-alone programs described in the following pages: VIP Writer, VIP Speller, VIP Calc, VIP Database, VIP Terminal & VIP Disk-ZAP. You can buy the entire Integrated Library at once, or you can buy one or two programs that you need now and upgrade to the integrated Library later.†

Shared Files, Shared Features

All VIP Integrated Library applications share common features, such as ease of use, built-in help, the same commands, full printer control, full use of your 64K of memory, and step-by-step tutorials. Most important, all essential applications feature professional high resolution lowercase displays to give you a choice of 51, 64, or 85 characters per line, with 21 or 24 lines per screen. You get a professional display on your Color Computer without any hardware modification!

Test Drive VIP Library For Only \$14.95

The \$14.95 will apply to the purchase of any VIP product bought through VIP Technologies. This test drive offer is available only through VIP Technologies.

*Those already owning one VIP product, except for VIP Speller, may purchase the Integrated Library by sending in the VIP program with a check or money order for \$99.95. This upgrade ofter is limited to one Library per person; credit will ONLY be given for one VIP program, regardless of how many are owned. This upgrade offer is available ONLY through Softlaw, and not through Radio Shark stores or dealers. Be sure to include \$6.00 for shipping and handling.

VIP Writer™

additional Cost!! RATED TOPS IN RAINBOW COLOR COMPUTER MAGAZINE & COMPUTER USER

The most powerful and easy-to-use word processor is available in the showpiece and workhorse of the Library: The VIP Writer".

The result of two years of research, the VIP Writer™ offer every feature you could desire from a word processor. It is the most powerful, fastest, most dependable and most versatile. With the hires display, workspace and compatibility features built into the Library the Writer is also the most usable.

"... Nearly every feature and option possible to implement on the Color Computer. The design of the program is excellent; the programming is flawless." October 1983 "Rainbow"

"Among word processors for the CoCo, VIP Writer stands alone as the most versatile, most professional program available." May 1984 "Computer User

The Writer will work with you and your printer to do things you always wanted to do. Every feature of your printer can be put to use, every character set, every graphics capability at any baud rate, EVEN PROPORTIONAL SPACING. All this with simplicity and elegance. You can even automatically print multiple copies.

Although all versions feature tape save and load, the disk version provides the Mini Disk Operating System common to the whole Library, plus disk file linking for continuous printing.

Professional features of particular note:

- Memory-Sense with BANK SWITCHING to fully utilize 64K, giving not just 24 or 30K, but up to 53K of workspace with the tape version and 50K with the disk version.
- TRUE FORMAT WINDOW allowing you to preview the printed page ON THE SCREEN BEFORE PRINTING, showing centered lines, headers, FOOTNOTES, page breaks, page numbers, & margins in line lengths of up to 240 characters. It makes HYPHENATION a snap.
- A TRUE EDITING WINDOW in all 9 display modes for those extra wide reports and graphs (up to 240 columns!).
- FREEDOM to imbed any number of PRINTER CONTROL CODES anywhere, EVEN WITHIN JUSTIFIED TEXT.
- Full 4-way cursor control, sophisticated edit commands, the ability to edit any BASIC program or ASCII textfile, SEVEN DELETE FUNCTIONS, LINE INSERT, LOCATE AND CHANGE, wild card locate, up to TEN SIMULTANEOUS block manipulations, word wrap around, programmable tabs, display memory used and left, non-breakable space, and headers, footers and FOOTNOTES.
- Automatic justification, automatic pagination, automatic centering, automatic flush right, underlining, superscripts, subscripts, pause print, single-sheet pause, and print comments.
- Type-ahead, typamatic key repeat and key beep for the pros, ERROR DETECTION and UNDO MISTAKE features, 3 PROGRAMMABLE functions, auto column creation, and instant on-screen HELP.

Radio Shack Catalog No. 90-0141 32K (Comes with tape & disk) \$69.95 VIP Writer — VIP Speller Combo comes in VIP Writer Binder.

VIP Speller™

WITH A 50,000 WORD INDEXED DICTIONARY!

By Bill Argyros

Gone are the eyestrain, boredom and fatigue from endless proof-reading. VIP Speller™ is the fastest and most user-friendly speller for your CoCo. It can be used to correct any ASCII file - including VIP Library'" files and files from Scripsit'" and Telewriter". It automatically checks files for words to be corrected, marked for special attention or even added to the dictionary. You can even view the word in context, with upper and lowercase. VIP Speller** comes with a specially edited 50,000 word dictionary which, unlike other spellers for the CoCo, is indexed for the greatest speed. The shorter your file, the quicker the checking time. And words can be added to or deleted from the dictionary or you can create one of your own. VIP Speller™ also comes with the Library's mini disk operating system.

> Radio Shack Catalog No. 90-0142 32K DISK ONLY \$49.95

Hi-Res Lowercase displays not available on this program.

Includes VIP Speller

at no

Window UIP Writer - When Joy Neet Real Power

When you want the power of a real word wathing, when you want up to 65 characters per line with your Color Computer, when you want to wake your printer really wove, you need AIP Writer.

VIF Writer is a state-or-tre-art word processor for the pros. It is bashed with commands, features and options, yet it's simple to learn and use. Who else gives you co-line help, and ever an Undo command to undo wistakes!

A meat feature is the Freyiew Window, which you see in use nere. This resture allows you to give your text just as it will be printed - centered fittles, page numbers, fortholds, even JRTFI(ATJ)A for even left and right-hand Hergins! Ho wine quess work. NIP Wroter is your answer!

PM 1 uh 1 (h 1 uh 8 AT 52

You can forget the other toy calcs — The real thing is here! No other spreadsheet for the Color Computer gives you:

- 20 ROWS BY 9 COLUMNS ON THE SCREEN AT ONCE
- LOWERCASE LETTERS WITH DESCENDERS
- UP TO 16 CONCURRENT DISPLAY WINDOWS
- **FLOATING-POINT MATH**
- CHOICE OF SINGLE AND DOUBLE PRECISION WORKS WITH BASE 2, 10, AND 16 NUMBERS UP TO 512 COLUMNS BY 1024 ROWS
- **USER DEFINABLE WORKSHEET SIZE FOR MORE MEMORY**
- LOCATE FUNCTION TO FIND CHECK NUMBERS, NAMES, ETC.
- **COLUMN/ROW MULTIPLE SORTS**
- PROGRAMMABLE FUNCTIONS
- IMBEDDABLE PRINTER CONTROL CODES
- 21 ALTERABLE PRINT FORMAT PARAMETERS ON-LINE HELP TABLES
- DOES NOT REQUIRE FLEX OR BASIC

VIP Calc™ is truly the finest and easily the most powerful electronic worksheet and financial modeling program available for the Color Computer. Now every Color Computer owner has access to a calculating and planning tool better than VisiCalc™, containing all its features and commands and then some, WITH USABLE DISPLAYS. Use Visicalc templates with VIP Calc™!

There's nothing left out of **VIP Calc™**. Every feature you've come to rely on with VisiCalc™ is there, and then some. You get up to **5 TIMES** the screen display area of other spreadsheets for the Color Computer and Memory-Sense with BANK SWITCHING to give not just 24, or 30, but UP TO 33K OF WORKSPACE IN 64K!!! This display and memory allow you the FULL SIZE, USABLE WORKSHEETS you require. You also get: User definable worksheet size, up to 512 columns by 1024 rows! * Up to SIXTEEN VIDEO DISPLAY WINDOWS to compare and contrast results of changes * 16 DIGIT PRECISION * Sine, Cosine and other trigonometric functions, Averaging, Exponents, Algebraic functions, and BASE 2, 8, 10 or 16 entry * Column and Row, Ascending and Descending SORTS for comparison of results * LOCATE FORMULAS OR TITLES IN CELLS * Easy entry, replication and block moving of frames * Global or Local column width control up to 78 characters width per cell * Create titles of up to 255 characters per cell * Limitless programmable functions * Typamatic Key Repeat * Key Beep * Typeahead * Print up to 255 column worksheet * Prints at any baud rate from 110 to 9600 * Print formats savable along with worksheet * Enter PRINTER CONTROL CODES for customized printing with letter quality or dot matrix printer * Combine spreadsheet tables with VIP Writer' documents to create ledgers, projections, statistical and financial reports and budgets. Both versions feature Tape save and load, but the disk version also has the Mini Disk Operating System of the entire Library.

Radio Shack Catalog No. 90-0143

32K (Comes with tape & disk) \$69.95 32K does not have hi-res displays, sort



RATED BEST IN JANUARY 1984 "RAINBOW"

By Dan Nelson

From your home or office you can join the communication revolution. The **VIP Terminal** opens the world to you. You can monitor your investments with the Dow Jones Information Service, or broaden your horizons with The Source of CompuServe, bulletin boards, other computers, even the mainframe at work.

For your important communication needs you've got to go beyond software that only lets you chat. You need a smart termnal so that you can send and receive programs, messages, even other VIP Library¹¹⁰ files. VIP Terminal¹¹¹ has "more features than communications software for CP/M, IBM and CP/M 86 computers." Herb Friedman, Radio Electronics, February 1984

FEATURES: Choice of 8 hi-res lowercase displays ' Memory-Sense with BANK SWITCHING for full use of workspace * Selectively print data at baud rates from 110 to 9600 * Full 128 character ASCII keyboard * Automatic graphic mode * Word mode (word wrap) for unbroken words * Send and receive Library files, Machine Language & BASIC programs. Duplex: Half/Full/Echo, Word length: 7 or 8, Parity: Odd/Even or None, Stop Bits: 1-9 * Local linefeeds to screen * Save and load ASCII files, Machine Code & BASIC programs * Lowercase masking * 10 Keystroke Multiplier (MACRO) buffers to perform repetitive pre-entry log-on tasks and send short messages. Programmable prompt or delay for send next line. Selectable character trapping * Send up to ten short messages (KSMs), each up to 255 characters long, automatically, to save money when calling long distance.

All versions allow tape load and save of files and KSMs, but the disk version also has the Mini Disk Operating System.

> Radio Shack Catalog No. 90-0139 32K (Comes with tape & disk) \$49.95 (Tape works in 16K but without hi-res displays)

Available By Express Order

Radio Shack is a registered trademark of Tandy Corporation.

All prices subject to change without notice. TRS-80 is a trademark of Tandy Corp. VisiCalc is a trademark of VisiCorp.

1984 by Softlaw Corporation

P Database

"ONE OF THE BEST" JULY 1984 "RAINBOW"

By Tim Nelson

This high speed MACHINE LANGUAGE program fills all your information management needs, be they for your business or home. And it does so better than any other database program for the Color Computer, featuring machine code, lowercase screens and mailmerge capabilities. Inventory, accounts, mailing lists, family histories, you name it, the VIP Database™ will keep track of all your data, and it will merge VIP Writer™ files.

The VIP Database™ features the Library Memory Sense with BANK SWITCHING and selectable lowercase displays for maximum utility. It will handle as many records as fit on your disk or disks. It is structured in a simple and easy to understand menu system with full prompting for easy operation. Your data is stored in records of your own design. All files are fully indexed for speed and efficiency. Full sort of records is provided for easy listing of names, figures, addresses, etc., in ascending or descending alphabetic or numeric order. Records can be searched for specific entries, using multiple search criteria. With database form merge you may also combine files, sort and print mailing lists, print "boiler plate" documents, address envelopes - the list is endless. The math package even performs arithmetic operations and updates other fields. Create files compatible with the VIP Writer and VIP Terminal. Unlimited print format and report generation with the ability to imbed control codes for use with all printers.

As with all other **Library** programs, the **Database** features the powerful Mini Disk Operating System.

Radio Shack Catalog No. 90-0140 32K DISK \$59.95

64K Required for math package & mail merge

RAVED ABOUT IN THE APRIL 1983 "RAINBOW!"

By Tim Nelson

Your database file disk, form letter disk, or BASIC program disk goes bad. An I/O error stops loading, or even backing up of the disk. Weeks, even months of work sit on the disk, irretrievable. Now catastrophic disk errors are repairable, quickly and with confidence, using the VIP Disk-ZAP**. It is the ultimate repair utility for simple and quick repair of all disk errors. Designed with the non-programmer in mind, the VIP Disk-ZAPTM will let you retrieve all types of bashed files, BASIC and Machine Code programs.

This high-speed machine code disk utility has a special dual cursor screen display to look at the data on your disk. You are able to: Verify or modify disk sectors at will * Type right onto the disk to change unwanted program names or prompts * Send sector contents to the printer * Search the entire disk for any grouping of characters * Copy sectors * Backup tracks or entire disks * Repair directory tracks and smashed disks * Fuli prompting to help you every step of the way * 50-plus page Operators Manual which teaches disk structure and repair.

> Radio Shack Catalog No. 90-0144 16K DISK \$49.95

Hi-Res Lowercase displays not available with this program.

To Order Direct Call: MosterCord



-800-328-2737

Order Status and Software Questions call (805) 968-4364 MAIL ORDERS: \$3.00 U.S. Shipping per product (\$6.00 CANADA; \$20.00 OVERSEAS). Personal checks allow 3 weeks.



132 Aero Camino Goleta, California 93117

Deciphering Printer Control Codes

By Richard White Rainbow Contributing Editor

significant problem for a program author is the variety of printers that may be hooked up to a given machine. About the only thing that's standard is the interface hardware. Otherwise, printer control codes vary with each manufacturer's product line, sometimes they are different for various machines from the same manufacturer. Even worse are those machines which need something more than just a carriage return to print a blank line.

Fortunately, the situation is improving as most of the large volume printers sold over the past two years have DIP switches that can be set to configure the printer to match a computer for at least printing text. (Printing graphics is a different can of worms that we won't get into.)

A BASIC program still needs to have some adaptability to the system's printer. Ability to change the Baud rate covers most circumstances. In the Serial mode, Radio Shack printers support either 600 Baud or a choice of 600 or 1200 Baud.

Most other modern printers can most easily be purchased with a standard parallel interface and connected to the CoCo with one of the serial to parallel interfaces advertised in RAINBOW.

Some users then run their CoCos at 2400 or 4800 Baud. I bought a serial to parallel interface to use with my old LP VIII and run at 9600 Baud with no trouble.

(Richard White has a long background with microcomputers and specializes in BASIC programming. With Don Dollberg, he is the author of the TIMS database management program.)

In the CoCo, Baud rate is determined by the values in memory locations 149 and 150. After a cold start, 149 carries a zero while 150 is set at 87 corresponding to 600 Baud. Most owners will be able to send to the printer at 300 Baud or higher and can forget about memory location 149. The exceptions are those running old teletype machines at 110 Baud or less.

There is a table in the Color BASIC manual which shows what to PDKE into 150 for various Baud rates. This system, isn't perfect. I know of some CoCos that need a seven in 150 instead of a six to produce an acceptable 4800 Baud. The PDKE 150,1 for 9600 Baud is not documented in the manual, but works for all machines I know of. I do a lot of printing and the benefits of 9600 Baud versus 1200 are well worth a \$60 adapter.

The printer routine for the CHECKBOOK program starts in Line 600. The first order of business is a rather fancy routine to calculate the currently set Baud rate and give the user the option to change it.

600 'TARGET LINE 605 POKE65494,0:BP=PEEK(150):BU=INSTR(1, "16:18**41******87***********180", RIGHT\$(STR\$(BP),LEN(STR\$(BP))-1)):BU=9600/BU

First, we assure that CoCo is running at the standard clock speed with the POKE65494,0. Next, we get the value in 150 into variable BP.

The next operation is to find a value that can be divided into 9600 to yield the currently set Baud rate. This is done in the complicated INSTR function. INSTR looks through

a target string for an occurrence of a search string, and reports the number of character positions from the beginning of the target string that it finds the search string.

But, there is a rat in BASIC's woodpile. When a number is converted to a string, a space is hooked onto the beginning like STR\$(1)=''1'''. To get a first character position match, we need to strip off the space; it gets a little complicated.

If we go step by step through the code RIGHT\$(STR\$(BP),LEN(STR\$(BP))-1)) it will make sense. STR\$(BP) converts the number in BP to a string. LEN(STR(BP)) finds the length of the string including the leading space. Subtract one and we have the length of the characters in the string without that space. When we get the right portion of the string for length -1 with RIGHT\$, we will have the characters only as we need.

Is there an easier way? Searching DATA in a loop is one other way. If Baud rate was the only use for DATA in your program it would be easier. I like Line 605, since all the code is on one line, it does not require looping, and is a useful example to show how both INSTR and STR\$ work.

```
610 CLS:PRINT@137, "PRINT RDUTINES",,,

" CURRENT BAUD RATE ="BU,
TAB(6) "RESET BAUD RATE",,," PRINT",,,,

" RETURN":CT=1
```

In Line 610, we clear the screen, print an entire menu which includes the Baud rate we just determined, and set a counting variable, CT1. The commas are the key — they move the print position to either character position (column) 17 on the screen, or to the beginning of the next line if the print position is at or past Column 17.

After printing RESET BAUD RATE, the print position is past Column 17, so one comma moves to the beginning of the next line. Two more commas create a blank line. Note that "PRINT" does not reach Column 17, so four commas are needed to create the blank line between PRINT and RETURN.

```
615 CT$=RIGHT$(STR$(CT),1):
    LP=INSTR(1," 1 2 3",CT$):
    LP=LP*32+2: PRINTèLP,">";: GOSUB1:
    PRINTÈLP," ";: IF 1$=CHR$(10)ANDCT<3 THEN
    CT=CT+1: GOTO615 ELSE IF I$=CHR$(94)ANDCT>1
    THENCT=CT-1: GOTO 615 ELSE IF I$<>CHR$(13)
    THEN 615 ELSE ON CT GOTO 620,630,100
```

Line 615 is another one that is packed with action. We want to move a '>' pointer up or down the menu using the arrow keys pointing to the RESET BAUD RATE, PRINT or RETURN choices. When the program first enters Line 615, CT=1. This is converted to a string with the leading space stripped off as discussed before and put into CT\$. INSTR is used to obtain a line count from the top of the screen. This value in LP does us little good,

since PRINT® needs a print position count and not a line count. LPLP*322 provides this as well as moving the print position into Column 3.

The '>' is printed pointing to the RESET BAUD RATE choice and the program goes off to the INKEY\$ subroutine in Line 1. The remainder of the line decodes the keystroke that INKEY\$ put into I\$. CT may be indexed up or down within the 1-3 range, and the '>' pointer is moved accordingly on the menu. If the user makes a choice by hitting ENTER, the ASCII character 13, a carriage return is returned and the ON CT GOTO 62,630,100 is used to initiate the chosen action.

```
620 PRINT" ";: INPUT"ENTER NEW BAUDRATE";BU$:
BU$=LEFT$(BU$,1): BL=INSTR(1,"361249",BU$):
IF BL=0 THEN PRINT"baud rate error": SOUND100,50: GOTO605
```

The allowed Baud rate choices are 300, 600, 1200, 2400, 4800 or 9600. Each value starts with a digit that is unique. This means we can get the user's choice in a string, strip off the leftmost character and use that to search a target string with INSTR to get a value. This is done in Line 620 which also includes an error trap that sends the user back to the menu.

```
625 BU(1)=180:BU(2)=87:BU(3)=41:BU(4)=18:
BU(5)=6:BU(6)=1:BU=BU(BL):POKE150,BU:GOTO605
```

In Line 625, the values to be poked for each Baud rate are defined in the BU(X) array. BU=BU(BL): POKE150, BU uses BL which has the number returned by INSTR to choose which value to use and then pokes that value.

With the Baud rate now selected, the user is returned to the menu presumably to select PRINT, but with a chance to verify that the selected Baud rate is correct, or choose not to print and return to the data entry routine.

```
630 CLS: PRINT@96, "SET PRINTER AND PAPER AND PRESS
     any key.": 60SUB1: FORX=1T03: PRINT#-2," ":
    NEXT: PRINT#-2, TAB(B) "ACCOUNT NAME: "AN$:
     PRINT#-2, TAB(B) *BANK NAME:
                                     "BA$:
    PRINT#-2, TAB(B) "ACCOUNT NUMBER: "AC$
648 GOSUB4: PRINT#-2, TAB(8) *DATE PRINTED:
                                              "DA$:
    PRINT#-2, " ":PRINT#-2, TAB(8) "CALCULATED
    BALANCE AT BANK = "BB: PRINT#-2," ":
    PRINT#-2, TAB(8) "CHECK# DATE
                                     AMOUNT
    BALANCE STATUS NOTE": PRINT#-2," ":
    PG=13
650 FORCR=1TOLR-1: GOSUB16: PRINT#-2.TAB(9) **::
    PRINT#-2,USING"% %";CC$;: PRINT#-2,USING
    " % %";CD$;: PRINT#-2,TAB(22)"";:
    PRINT#-2,USINGSS$; CA;: PRINT#-2, TAB(32) "";:
    PRINT#-2,USINGSS$; CB;:
    PRINT#-2,"
                  *CS$*
```

Lines 630 and 640 print the page heading information to start the report listing all transactions in the current file. These entries are then printed with a FOR...TO...NEXT loop starting in Line 650. Print positions are set using TAB as in PRINT#-2, TAB(9)'''; PRINT USING is used to format the data printed. Separate PRINT statements are needed with PRINT USING so we cannot string sequences of text and variables after one PRINT.

655 PG=PG+1: IFPG>61THENFORX=1T07: PRINT#-2," ":

NEXT: PRINT#-2,TAB(0)

"CHECK# DATE AMOUNT BALANCE STATUS NOTE":

PRINT#-2," ": PG=5 660 NEXT: FORX=PG T067: PRINT#-2," ": NEXT: RETURN

If our file is big, it will require a number of pages. Of course, we want this neatly done with bottom and top margins on the pages, and headings on the top of each added page. Some of the new fancy printers may do some of this, but with my old one, it's "I print, you keep track." So, PG=PG+1 counts lines as they are sent to the printer. IFPG>61THEN FORX=1T07: PRINT#-2, ''': NEXT texts for the last line on a page to be printed. When it is reached, blank lines are printed, moving the new page into position.

Finally, new headings are printed and PG is reset to five, the number of lines on the new page that were used. When the last entry is printed, Line 660 does a "top-ofform," to position the top of the next sheet under the print head.

After all this programming work, let's ask what might be an embarrassing question. Why not do the program in a spreadsheet and forget about BASIC? That is a fair question. So fair, in fact, that starting next month "Bits And Bytes" will begin a series on CoCo spreadsheets and their use.

However, the code that starts in Line 400 of the *CHECKBOOK* program does what no CoCo spreadsheet can do. It automatically copies all cleared items to a



monthly file of cleared items on tape or disk, and writes the current file to a backup file called *CURRENT/BAK* on disk. It then strips all cleared items from the current file in memory and returns to the data entry mode. This new in-memory file only includes items that have not yet cleared the bank.

There was a bug in the code as published in the January RAINBOW which we will set right in this discussion, and perhaps learn a thing or two in the process.

One needs to be very careful in automatic file naming, particularly if the code is to work on both tape and disk. The name CURRENT/BAK produces an FN Error (filename) in the tape save mode. Further, I found that when I had loaded the backup file using CURRENT/BAK and then tried to use this module, the computer tried to save the backup file as CURRENT/BAK/BAK. What a no-no!

400 CLS:PRINT08,RC\$," STRIP & SAVE CLEARED ITEMS"
,,,,,TAB(0)"tAPE",,,,TAB(0)"dISK",,: GOSUB1:
IF I\$="D" THEN D=1 ELSE IFI\$="T" THEN D=-1
ELSE 400

410 PRINT: PRINT: IFD=-1THENPRINT* TAPE FILE*
ELSE PRINT* DISK FILE*

415 PRINT: PRINT"FILENAME";: IF D=1 THEN PRINT" AND EXTENSION"

420 LINEINPUTCF\$: GOSUB4: CT=0: FORCR=1TDLR-1: GOSUB16: IF CS\$=*C" THEN CT=CT+1: NEXT ELSE NEXT

Lines 400-420 provide the entry menu that gets the disk/tape choice and then the filename, CF\$, in Line 420 for the file of cleared items. Line 4 is called to allow users to change the date if they wish. The rest of Line 420 goes through the file in memory counting the number of cleared items. In order for the cleared item file to be reloaded, the number of the next record to be added (if one is to be added) must be the first entry.

425 OPEN"O",D,CF\$: PRINT#D,CT+1: PRINT#D,BB:
PRINT#D,CB: PRINT#D,AN\$: PRINT#D,BA\$:
PRINT#D,AC\$: PRINT#D,DA\$: FORCR=1TOLR-1 430 GOSUB16: IF CS\$="C"
THEN PRINT#D,A\$(CR):
PRINT#D,A(CR,0): PRINT#D,A(CR,1): NEXT
ELSE NEXT

Line 430 opens the file, prints the standardized beginning variables and then goes through all the records in memory, finding those that are cleared and saving these to the file.

435 CLOSE: CT=0: OFEN"D",D,"BACKUP": PRINT#D,LR:
PRINT#D,BB: PRINT#D,CB: PRINT#D,AN\$:
PRINT#D,BA\$: PRINT#D,AC\$: PRINT#D,DA\$:
FORX=1TOLR-1: PRINT#D,A\$(X): PRINT#D,A(X,0):
PRINT#D,A(X,1): NEXT: CLOSE

In Line 435, we close the cleared-item file, open the backup file and fix a bug. The open statement used to read OPEN''O'', D, MN\$+'''>BAK''', which I guarantee will bomb a tape save or disk save where NM\$ is something like "CURRENT/BAK." All records in memory are saved

NEW STAR PRINTERS

- * replace the Gemini printers
- * draft modes from 120-200 cps.
- * near letter quality from 30-50 cps
- * switch selectable compatibility: IBM, Apple, Commodore, and Gemini standard
- * 1 year warranty

SG-10- \$ 259. SG-15- \$ 369.

SD-15- \$ 489. SD-10- \$ 379.

SR-15- \$ 639. SR-10- \$ 529.

plus shipping

C-ITOH PRINTERS

C-Itoh 8510AP Prowriter -- \$ 319. 120 c.p.s.

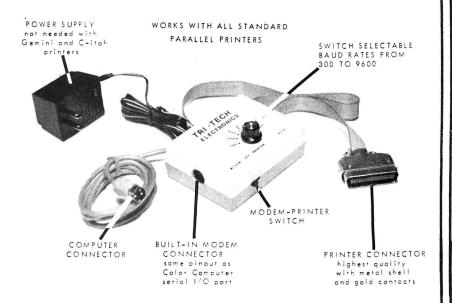
C-Itoh 8510BPI Prowriter -- \$ 359. IBM compatible

C-Itoh 8510SP Prowriter -- \$ 409. 180 c.p.s.

C-Itoh 8510SCP Prowriter- \$ 469. 180 cps., 7 colors

plus shipping

PARALLEL PRINTER INTERFACE



MODEL 1 \$ 59.95

with modem connector & switch

without power \$ 54.95

WODEL 3

without modem connector & switch

without power \$ 44.95

ADD 3.00 FOR SHIPPING AND HANDLING

DISK SYSTEMS & ACCESORIES



TEAC FD54A----- \$ 99. single sided, 40 track

TEAC FD55A----- \$ 129. single sided, 40 track

TEAC FD55B----- \$ 155. double sided, 40 track

TEAC FD55F----- \$ 169. double sided, 80 track

J&M Disk Controller- \$ 125. (JDOS or RSDOS)

Dual Drive Case & Ps. - \$ 59.

Dual Drive Cable---- \$ 23.

DISK DRIVE SPECIAL

COMPLETE DRIVE 0 SYSTEM

TEAC FD54A DISK DRIVE

J&M DISK CONTROLLER (JDOS or RSDOS)

DUAL DRIVE CASE & POWER SUPPLY

COMPREHENSIVE MANUAL

^{\$} 275.

plus shipping

DRIVE O DISK SYSTEMS



J&M DISK CONTROLLER (JDOS or RSDOS)

DUAL DRIVE CASE & POWER SUPPLY, CABLE, & MANUAL

PLUS YOUR CHOICE OF ONE OF THE FOLLOWING DRIVES.

TEAC FD55A---- \$ 305.

TEAC FD55B---- \$ 330.

TEAC FD55F---- \$ 345.

plus shipping

TRIECH ELECRONGS

to this file. In a disk system, this will write over the existing backup file which should no longer be needed. The current file in memory is assumed to be correct before being stripped.

440 FOR CR=1TO LR-1: GOSUB16: IFCS\$="0"THEN CT=CT+1: A\$(CT)=A\$(CR): A(CT,0)=A(CR,0): A(CT,1)=A(CR,1): NEXT ELSE NEXT

Line 440 strips cleared items from the file. The procedure is very simple. The count variable CT was set to zero in Line 430. Each record is checked to see if its status CS\$ is 'O' (for outstanding). If so, the count is incremented and the string and numeric components are copied into the CT array members. Outstanding items are copied into array members that previously contained records that have been cleared. When CR reached LR-1, all array members up to A\$(CT), A(CT,0) and A(CT,1) will contain data relative to outstanding records.

445 FOR X=CT+1 TO LR-1:A \$(X)="": NEXT: LR=CT+1: CR=CT: RETURN

Finally, we'll do some housekeeping. All strings in the array members from A\$(CT) to A\$(LR-1) are nulled. This looks neat, but is like washing the plates as you take them from the dishwashing machine at the end of the cycle. If you save the current file and then reload it later, these strings and their addresses will long since be gone from memory. If you should immediately add some more records, the addresses to the new data string will be set in the variable table and the old strings will be lost and wiped out during the next garbage collection.

Some things will look like just the right thing to do, but be totally unnecessary. Is it important to get this out of the program? As long as memory usage is not an issue and you don't mind waiting a few tenths of a second, the answer is "no." If ability to change the program in the future is important, the answer is "yes." Useless code only confuses. Once this column is done, I have some program editing to do.

The last part of Line 445, LR=CT+1: CR=CT: RETURN is very important, for here the current stripped file size is specified and CR is set to point to the last record. RETURN sends the program back to the data entry module where the user has the option to save the new current file and exit the program, or continue with data entry or editing.

For my current needs, the program works well. But, running around in the back of my mind are ideas on how to write the world's greatest checkbook balancing program in a spreadsheet. I may inflict you, poor reader, with another of these beasts yet!

Hint . . .

Format Your Printouts With This Disk Utility

This short program by Ted Cizadlo Selig will let you format your LLISTings for any column width you please. One use for it is in debugging programs you key in from RAINBOW listings; by making your printout the same width (32 columns) as our printed listings, you can more easily see any errors you might have made. If you have a 9½-inch wide carriage printer and usually use ordinary 9½-inch fanfold paper, you can make listings 80 columns wide so they won't spill off the right side.

To use the program, simply save the program you want to LLIST in ASCII on disk (SAVE "program/ext", A) and run this program. Enter the column width you want and the filename including the extension, and away it goes.

A short note: The IF F THEN...statements in lines 140 and 150 are correct, even though they don't have a number to compare 'F' to or even a sign. When an IF/THEN statement is expressed this way, BASIC checks to see if the variable is equal to zero.

The listing:

5 CLEAR500:CLS:INPUT"NUMBER OF C HARS/LINE";CL 10 INPUT"FILE NAME WITH EXTENSION

10 INPUT"FILE NAME WITH EXTENSIO N(MUST BEIN ASCII FORMAT)"; N\$

20 C=0:F=1

30 OPEN"I",#1,N\$

50 LINEINPUT #1,A\$

60 IF EOF(1)=-1THEN F=0

70 X=LEN(A\$)

75 IF X<=CL THEN 150 ELSE IF X=0 THEN 50

90 N=1

100 FOR J=1 TO INT(X/CL+1)

110 PRINT#-2, MID\$(A\$, N, CL): C=C+1

120 N=N+CL

130 NEXT J

140 IF F THEN 50 ELSE CLOSE#1:EN

D

150 PRINT#-2,A\$:C=C+1:IF F THEN1

60 ELSE CLOSE#1:END

160 GOTO 50

170 CLOSE#1:END

RAINBOWfest CHICAGO

See You At

For Details
See Page 114

May 17-19

Once again, folks, it's time to

EXPERIENCE THE THRILL OF ADVENTURE

By Charles Springer

Dtrike up the band and unfurl the flags, please, because we have an exciting announcement:

It's time for THE RAINBOW's Third Annual Adventure Contest!
From the barrage of entries we received for last year's contest, many of you anticipate these climactic events and are already at work on a new Adventure. Approximately 150 entries were received from almost every state in the union and from several countries.

The Adventure has come a long way since our first contest in 1983 and we'd like to think (blush) that THE RAINBOW's contests have played a significant role in advancing the art. As we've noted before on these pages, the staff enjoys these contests as much as the participants because the competitive atmosphere is an obvious catalyst for programming breakthroughs.

EPSON+ PRINTER SPECIAL **NEW LOW PRICE EPSON RX-80FT PRINTER GEMINI 10-X PRINTER** 64-E1 64-2 TS-2 TV STAND VC-3 ***** **64K MEMORY UPGRADES** VIDEO INTERFACE



EPSON RX-80FT+

New Epson+ with true 100 cps and unbelievable graphics. Friction and pin

feed. Built-in Epson serial interface and color computer to Epson cable. 1 year warranty. \$317 complete (\$7 shpq.)

RX-80 with Epson serial interface and cable. \$287 (\$7 shpq.)



GEMINI 10-X

Gemini 10X. Fast, accurate 120 characters per

second, 10" wide carriage, friction and pin-feed printer. Includes internal Gemini serial interface and color computer to Gemini cable.

\$318 complete (\$8 shpg.)

Delta 10X 160 cps parallel & serial with 8K buffer & cable. \$375 (\$9 shpg.)





DRIVE 0 PACKAGE ★

Our drive 0 package gives you more on-line storage for your dollars-202,752 bytes more than a 35-track RS Disk Drive, to be exact. Included is

a half-height, double-sided double-density TEAC drive with slim-line case and heavyduty power supply, a J & M controller, and a gold-plated connecting cable. Write for a

359,424 Byte Drive 0 Package \$344 complete (\$7)

free copy of our report that answers questions about the differences in disk drives. Call for

additional drive prices.

EXTRAS!



NEW STANDS

Howard introduces its newly designed stands with side access to

TS-1X NEW TV Stand: Higher and sturdier than TS-1 with open sides, \$39.50 (\$3 shpg.)
TS-1: Our standard for the original Color Computer. 15×11×4.

\$29.50 (\$3 shpg.)

TS-2: For Color Computer 2. \$29.50 (\$3 shpg.)

PS-1X NEW Printer Stand with noise suppressing foam top and cork base. \$24.95 (\$3 shpg.)

DISKETTES

HC-1: New from Verbatim. Head cleaner kit. 2 disks with pre-applied solvent and reusable jacket. \$9.50/set. \$14 for 10 refills. (\$2 shpg.)

VD-1: Verbatim. 5 year warranty. 10/plastic box. Single sided, double density. \$24.70/bx. (\$2 shpg.) VD-2: Verbatim. 5 year warranty. 10/plastic box. Double sided, double density. \$32.30/bx. (\$2 shpg.) ND-1: No name, but with 30 day return. 10/plastic box. Single sided, double density. \$14.90/bx. (\$2) ND-2: No name, but with 30 day return. 10/plastic box. Double sided, double density. \$22.50/bx. (\$2)

CONTROLLERS

★DC-1 Disk Controller reads and writes to 35 and 40 track single and double sided drives with all models

of the color computer. (J & M) \$128 (\$2 shpg.)

SW-1 Switch between J-DOS & RS DOS or your own Eprom. Mounts inside J & M controller. No soldering, no trace cuts. 3 position switch. \$29.45/ea. (\$2 shpg.)

VC-1 Video Interface mounts inside color computer by piggy-backing IC on top of interface—no soldering, no trace cuts. All models give composite video and sound. \$24.45 (\$2 shpg.) VC-2 for Color Computer 2—monochrome only. \$26.45 (\$2 shpg.)

VC-3 for COCO 2-color and monochrome. \$39.45 (\$2 shpg.)

VC-4 for new Color Computer with no sockets, where the chips are soldered to mother board. VC-4 attaches with spring loaded clips. Color & monochrome. \$39.45 (\$2 shpg.)

MEMORY 64K Upgrades—1 Year Warranty

64-El for E Boards. Complete instructions. Remove old chips and replace with this preassembled package—no soldering, no trace cuts. \$52.45 (\$2 shpg.)
64-F1 for F Boards. 8 chip kit requires no soldering. Capacitor leads must be cut. \$48.45 (\$2 shpg.)

★64-2 for Color Computer 2. Kit requires one solder point, no trace cuts. \$48.45 (\$2 shpg.)

SURGE SUPPRESSORS—\$16.25

SS-1 Surge Suppressor protects your data & equipment against power surges and transients. Reg. \$48 value. Howard's low price: \$16.25 (\$2 shpg.)



OUR UNMATCHED GUARANTEE

We offer a 30 day refund on all hardware that you purchase from Howard Medical. If for any reason you are not happy with the product, return it within 30 days for a prompt and courteous refund.

MONITORS

123 Zenith 12" Green Screen, 640 dots×200 dots resolution, 15 MHz band width. \$114 (\$7 shpg.)

122 Zenith 12" Amber Screen, 640 dots×200 dots resolution, 15 MHz band width. \$134 (\$7 shpg.)

131 Zenith 13" Color Monitor with speaker, composite & RGB jack, 240 dots×200 dots resolution, 2.5 MHz band width. \$334 \$14 shpg.)

NEW: 151 Roland 13" Color Monitor with speaker. 270 dots×200 dots resolution, 15.75 MHz band width. \$247 (\$12 shpg.)

All monitors require video controller

Volksmodem with cable. \$58.88 (\$2 shpg.)

Howard Medical Computers	Telephone (312) 278-1440 Computer Bulletin Board (31	10) 279 0512
Box 2, Chicago IL 60690 Cat.No. Quantity Description	Unit cost (Cost \$
My check or money order is enclosed. Credit Card # Send C.O.D. Expiration date	VISA AE Total Cost Shipping Ill. res. add 8% COD (add 1.90) Total order	



The Biggest

The Best



The Indispensab



It's called the premier Color Computer magazine for good reason. The Rainbow is the biggest, best, brightest and most comprehensive publication a happy CoCo ever had! Is there any wonder we get letters daily which praise the Rainbow, the magazine one reader calls "A Pot Of Gold" for his Color Computer?

The Rainbow features more programs, more information and more in-depth treatment of the TRS-80 Color, TDP System-100, MC-10 and Dragon-32 and 64 computers than anyone else

Each monthly issue has as many as 340 pages and contains as many as two dozen programs some 15 regular columns and 30 or more product reviews. And advertisments: the Rainbow is known as the medium for advertisers - which means every month it has a wealth of information unavailable anywhere else about new products! More than 200 companies advertise in its pages every month.

But what makes the Rainbow is its people. People like Bob Albrecht, the master teacher of computer programming. People like Don Inman, one of the world's best computer graphics authors. Experts like Dick White, one of the most knowledgeable writers about BASIC. Or, Dan Downard, Rainbow technical editor, who answers our readers' toughest questions. Educators like award-winning Rainbow columnist Steve Blyn. Advanced programmers like Dale Puckett, who guides you through Radio Shack's OS-9 operating system. Electronics specialists like Tony DiStefano, who explains the "insides" of the CoCo. These people, and many others, visit you monthly through columns available only in the Rainbow.

Innovative ideas, like our Scratch and Sniff Adventure or our Anniversary special "soundsheets" with recorded programs, are ready to feed right into your computer! Complete Adventure games and Simulations. The Rainbow's unique Scoreboard of arcade games. And games — lots of them — super graphics and utilities, the world's first four-color computer magazine centerfold! And much, much more.

Join the tens of thousands who have found the Rainbow to be the absolute necessity for their CoCo. With all this going for it, is it surprising that more than 95 percent of the Rainbow subscribers renew their subscriptions?

We're willing to bet that, a year from now, you'll be doing the same. For more information call (502) 228-4492

Tired of spending all your valuable computer time typing in those long, but wonderful, RAIN-BOW programs each month? Now there is RAINBOW ON TAPE to help ease the pain.

Each month all the lengthy programs (over 20 lines) in THE RAINBOW can come to you

Here's your chance to have a Pot O' Gold full of programs, articles and information about CoCo every month of the year! A subscription to **THE RAINBOW** is only \$31' and you won't miss a single

Get Your Very Own Pot O' Gold!

As the premier magazine for the TRS-80 Color and TDP-100 computers, **THE RAINBOW** has more of everything — and greater variety, too. Do yourself and your CoCo a favor and subscribe to

We accept VISA, MasterCard and American Express. Non-U.S. rates higher. U.S. currency only, please.

THE RAINBOW today!

chock-full issue.

ES! Sign me up for a year (12 issues) of THE RAINBOW

RENEW (Attach Label)

biggest bargain going. (Note: RAINBOW ON TAPE will not run on Dragon or MC-10 computers. Back issues are available beginning with April 1982. (except May 1983). Each month's tape will arrive at approximately the same time as that month's issue of **THE RAINBOW**. ready-to-run, thanks to RĂINBOW ON TAPE. At \$80° per year — or \$10 a tape ★★

me up for the biggest bargain going . . . RAINBOW ON TAPE! YES!

	□ NEW □ A Full Year	□ RENEW (Attach Label) □ A Month (Specify Mont
1	: Name	

& Year

71P	: City	State
	: Dayment Enclosed	Payment Enclosed (Payment must accompa
SS	Charge USA	☐ MasterCard ☐
	Account Number	
	Signature	Card Expirati
Cards	Subscriptions to RAINBOW ON TAPE in Canada and \$105 U.S. funds in all o	'Subscriptions to RAINBOW ON TAPE are \$80 in the United States, \$90 U.S. funds in Canada and \$105 U.S. funds in all other countries.

Express

☐ American

(Payment must accompany order) □ MasterCard □ American

Payment Enclosed

Address

Name

Account Number

Charge

gnature















'Subscriptions to **THE RAINBOW** are \$31 a year in the United States. Canadian rate is \$38 U.S. funds. Surface rate elsewhere is \$68 U.S. funds. Air mail is \$103 dollars U.S. funds. Alz Subscriptions begin with the current issue. Please allow 5-6 weeks for the first copy.

* * Back issues of the tapes are \$10 in the United States, \$12 U.S. funds for Canada and all other countries.

Card Expiration Date

VISA.

American Express

(Payment must accompany order)

Prospect, KY 40059 .O. Box 385

First Class **BUSINESS REPLY**

Prospect, KY

IF MAILED

What goes well with the Rainbow?



Rainbow On Tape!

We call it the other side of THE RAINBOW and we may have to raise the price just to call your attention to it. With as many as two dozen programs every month, Rainbow On Tape is a luxury service at a bargain basement price.

What is it? Rainbow On Tape is a monthly, cassette tape adjunct to THE RAINBOW and it's brimming with all the programs (those over 20 lines long) that fill the pages of the magazine. All you do is pop the cassette in your tape recorder and they're ready to run. No more lost weekends or weeknights — typing, typing, typing. With Rainbow On Tape, you can read the article in the magazine then, in seconds, you load it up and run it.

Yes, Rainbow On Tape is brimming with the programs that fill THE RAINBOW's pages each month. And, yes, you could type them in yourself, as many people do. But all of them? Every month? There simply isn't enough time.

Isn't it time your CoCo became a fulltime computer instead of a typewriter. Think how your software library will grow. With your first year's subscription, you'll get almost 300 new programs: games, utilities, business programs, home applications - the full spectrum of THE RAINBOW's offerings without the specter of keying in page after page and then debugging

Rainbow On Tape - the "meat" of THE RAINBOW at a price that's "small potatoes." Food for thought. To get your first heaping helping, just fill out and return the attached reply card. No postage necessary.

Discover the other side of THE RAINBOW. It's not only a time-saver, it's the key to a whole new outlook!

POSTAGE WILL BE PAID BY ADDRESSEE **BUSINESS REPLY** P.O. Box 385

Prospect, KY 40059

Prospect, KY



IF MAILED

SFEED RACER

SPEED RACER is a super car race game written in the POLE POSITION™ type of arcade game. It has unbelievable scrolling 3D graphics! Unconditionally guaranteed to be the finest car race game ever written for the COCO. \$34.95 Disk or Tape 32K.





Mich ton

576 S. Telegraph Road Pontiac, Michigan 48053 Orders & Info: (313) 334-6576

By now you've solved last year's grand prize winners — Rescue on Alpha II, by Steven C. Mitchell, and The Head of the Beast, by Mark Nelson (both appeared in our December 1984 issue) and taken note of their original approaches, along with the innovations, and have a good idea of what is required to wind up on top. Other winning entries will be published in The Second Rainbow Book of Adventures, which is in the early stages of production.

What we're looking for in Adventure contests are original concepts that appeal to a wide audience. An Adventure should be challenging, yes, but above all it should be fun to play. Arriving at a solution should require only a healthy portion of plain old common sense, not the ability to read the mind of an author you've never met.

The aspect of creativity is one that cannot be overemphasized. While we can appreciate scenarios involving castles and dungeons as much as the next person, a steady diet of them would cast the Adventure as a fad and it would end up in a heap in one of those 1,2000room mazes.

A creative program that comes to mind is Yellow Submarine, a graphics Adventure by Mark Fetherston of

Kenosha, Wis. Look for it in the second Adventure book because the subject obviously has great appeal. The mere title suggests this is one of those programs which could cause permanent damage to your knuckles in your haste to position it in the disk drive.

We're also looking for programs that demonstrate new capabilities for the Color Computer. Remember the excitement of loading in the first graphics Adventure? It gave all of us a collective sense of accomplishment and a renewed determination in fulfilling CoCo's incredible potential, as evidenced by the slew of graphics entries we received in last year's contest. We also received some entries that required joysticks.

"What we're looking for in Adventure contests are original concepts . . . "

We do expect some surprises because CoCo users have, time and again, proven themselves to be an innovative group.

Now, let's get to the rules. Our desire for fairness dictates that we establish a uniform set of guidelines. We've already mentioned creativity, of course. Other considerations include originality,

clarity of instructions and or documentation, ease of loading, grammar, resolution, responsiveness, level of challenge and, most importantly, enjoyment.

Please remember that each program must be "memory resident"; that is, selfcontained after being loaded into the Color Computer. For practical reasons, entries that access the disk while the program is running will not be considered. Disk-accessing leads to excessive length in programs. All entries should run on standard Radio Shack computer equipment, with no special modifications required because of the program.

We will consider only original, unpublished and unmarketed programs. One of the primary purposes of the programming competition is to bring new ideas and concepts to the CoCo. Conversions of existing programs, therefore, are not acceptable. Also, entries should be self-contained and not dependent upon other commercial programs for their execution.

In writing the Adventure, be careful not to pack the lines so tightly that we are unable to LIST or LLIST a line. If a program contains machine language, fully-commented source code must be provided as well as a working, assembled

500

POKES

PEEKS N EXECS

FOR THE

TRS-80 COLOR COMPUTER

Kishore M. Santwani

HIDE-A-BASIC 1.1

(A Breakthrough in Cassette Protection)

AT LAST! A program that combines autostart with complete protection of your valuable Basic programs.



- Autostarts your programs.
- A ML program that modifies your program and NOT just 'Stands Apart'.
- · Option to disable Break-key, Clear key & Reset button.
- Disables LIST, LLIST, EDIT, DEL, TRON, TROFF, CSAVE (M), CLOAD (M).
- Disables POKE, PEEK, EXEC & USR to prevent 'Back-door entry to your program.
- Disables disk functions to avoid access thru Disk System.
- Creates an 'ONERR GOTO' routine to trap errors.
- Your Basic program is loaded as a ML program with CLOADM.
- Full documentation.

WITH HIDE-A-BASIC 1.1 THERE IS PRACTICALLY NO WAY ANYONE CAN 'GET INTO' YOUR PROGRAM.

Buy Now & Protect your Profits. For 16K ECB Cassette System. Tape Only \$24.95.

DISKETTES



51/4" SS/DD Diskettes with tearless sleeves, hub rings, write-protect tabs, and Jackets.

QUANTITY	PRICE	SHIPPING
1	\$1.95	\$2.00
10	\$16.95	\$2.00
100	\$162.95	\$7.00
NO SHIPPING charg	es on disks if ordered wit	h any other software.

500 **POKES PEEKS** 'N EXECS for the TRS-80 COLOR COMPUTER

NEVER BEFORE has this information of vital significance to a programmer been so readily available to everyone. This book will help GET UNDERNEATH THE COVER of the Color Computer and develop your own HI-QUALITY programs. SO WHY WAIT?? This 80-page book includes

POKEs, PEEKs and EXECs to:

Autostart your basn: programs.

Disable Color Basic/ECB/Disk Basic commands like LIST. LLIST, POKE, EXEC. CSAVEIM). CLOADIM). DEL, EDIT, TRON.
TROFF, PCLEAR, DLOAD, RENUM, PRINT USING, DIR, KILL, SAVE. LOAD, MERGE, RENAME, DSKINI, BACKUP, DSKIS, and DSKOS.

- Disable BREAK KEY, CLEAR KEY and RESET BUTTON. Generate a Repeat-Key.
- Transfer ROMPAKS to tape (For 64K only).
- Speed up your programs
- Recover Basic programs lost by NEW
- Set 23 different GRAPHIC/SEMIGRAPHIC modes.
- AND MUCH MUCH MORE III

COMMANDS COMPATIBLE WITH 16K. 32K/64K COLOR BASIC/ECB/DISK BASIC CASSETTE and DISK SYSTEMS and CoCol and CoColl.

ONLY \$16.95

ORDER TODAYI VISA, MC. Check or MO. C.O.D. add \$2.50. Please add \$2.00 S&H (\$5.00 for foreign orders). NYS residents pl. add sales tax. All orders shipped WITHIN 24 HOURS!!!



..............

MICROCOM SOFTWARE PO Box 214, FAIRPORT, NY 14450

PH: (716) 223-1477 (9AM - 9PM -- 7 DAYS A WEEK) Dealer Inquiries Invited.



DISK \$44.95 NEW

Introducing The "Super Smart"

DATA PACK II

TAPE \$34.95

THE REPORT OF THE PARTY OF THE 28-64×24 Hi-Resolution Display **经产品的** THE REAL PROPERTY. ak Support Up To 55K Text Buffer Text Buffer

AN AN ANTANIA MANA

TERMINAL COMMUNICATIONS SOFTWARE Also Supports The PBJ 80 Column "Word Pak", Deluxe RS-232 Pak, Parallel Printer Card and PBJ 2SP Pak

"FEATURES"

- No Lost Information When Using Hi-Resolution Display On Line
- ASCII Compatible File Format Full Text Buffering
- Terminal Baud Rates 300 to 9600
- Automatic Word Wrap Eliminates Split Words Full/Half Duplex
- Automatic File Capture
- Programmable Word Length, Parity and Stop Bits Save and Load Text Buffer and Program Key Buffers to Tape
- or Disk
- 9 Hi-Resolution Display Formats, 28 to 255 x 24
- True Upper/lower Case Display
- Kill Graphics Option for an Extra 6K
- Supports Line Break

- Freeze Display and Review Information On Line
 Send Files Directly from Buffer or Disk
 Full Disk Support for Disk Version

- Send Control Codes from Keyboard Separate Printer Baud Rates 110-9600
- Display on Screen or Output Contents of Buffer to Printer
- Automatic Memory Sense 16-64K
 9 Programmable Function Key Variable Length Macro Buffer
 Programmable Prompt Character or Delay to Send Next Line

- Programmable Control Character Trapping Programmable Open/Close Buffer Characters
- Automatic Key Repeat For Editing
- Program and Memory Status Displays



MENI

"The Wait is Finally Over" **ANNOUNCING** The CBASIC COMPILER

Now anyone can create fast efficient Machine Language Programs without the Drudgery of using an Assembler.

MEN

CBASIC is a fast Machine Language integer Basic Complier that can convert Color Basic programs into fast machine language programs. CBASIC features over 100 Basic Commands and functions that fully support Disk, Tape, Screen and Printer I/O, Hi & Low Resolution Graphics, Sound, Play and String Operations just like Color Basic. CBASIC also includes a powerful full featured Basic program Editor using a 51,64 or 85 by 24 line display. The Hi-Resolution display can be automatically included in your compiled program for enhanced display capability and allow mixed text and graphic displays.

Graphics Commands:

CIRCLE, COLOR, CLS, DRAW, GET, LINE, PAINT, PCLS, PCOPY, PMODE, PRESET, PSET, PUT, RESET, SCREEN, SET, POINT, PPOINT

Sound Commands:

String Functions:

CHR\$, LEFT\$, MID\$, RIGHT\$, LEN, INSTR, LSET, RSET, TRM\$, STR\$, STRING\$, INKEY\$, MKN\$

ABS, POS, TIMER, RND, ASC, TAB, CAL, JOYSTK, Numeric Functions: PEEK, POKE, LOC, LOF, EOF, FREE, CVN, ERR.

VARPTR, SWAP

OPEN, CLOSE, INPUT, LINEINPUT, PRINT WRITE, I/O Commands: PRINT @, GET, PUT, KILL, CHAINM, FIELD, DATA,

READ, RESTORE

Program Control:

Directives

ON ERROR, ON RESET, ON IRQ/FIRQ/NMI, ON OVR/NOVR. EXEC. LET

ORG. REM OR', END. DIM, END. BASE, RAM, ON/ OFF, RAM64K, HIRES, GENERATE, DPSET, STACK

FOR/NEXT/STEP, GOTO/GOSUB, IF/THEN/ELSE, RETURN, STOP, RETI, ON n GOTO/GOSUB,

Editor Commands

LINE EDIT, AUTO EDIT, COPY, MOVE, RENUM-BER, AUTO LINE#, PRINTER, LIST, DELETE, SEARCH, REPLACE, BAUD RATE, PRINTER, CBASIC, TAPPEND, SKIP, SIZE, LOAD, SAVE, APPEND, KILL, DIR, and much, much more.

REQUIRES 32K and Disk, 64K recommended

Introductory Price \$119.00 Regularly \$149.00

33

NEW IMPROVED VERSION

- UP TO 85 CHARACTERS PER LINE READABILITY
- ADJUSTABLE AUTOMATIC KEY REPEAT
- PROPTECT 1-23 SCREEN LINES
- CONTROL CODE KEYBOARD
- FULLY BASIC COMPATIBLE
- DISPLAY FORMATS OF 28 to 255 CHARACTERS PER LINE FULL 96 UPPER/LOWER CASE CHARACTERS
- MIXED GRAPHICS & TEXT OR SEPARATE
- GRAPHIC & TEXT SCREENS
 INDIVIDUAL CHARACTER HIGHLIGHTING
- REVERSE CHARACTER HIGHLIGHT MODE
- WRITTEN IN FAST MACHINE LANGUAGE AUTOMATIC RELOCATES TO TOP OF 16/32K
- AUTOMATICALLY SUPPORTS 64K of RAM WITH RESET CONTROL
- REVERSE SCREEN
- ON SCREEN UNDERLINE
- DOUBLE SIZE CHARACTERS ERASE TO END OF LINE
- ERASE TO END OF SCREEN
- · HOME CURSOR
- BELL TONE CHARACTER
- HOME CURSOR & CLEAR SCREEN
 REQUIRES ONLY 2K OF RAM
- COMPATIBLE WITH ALL TAPE & DISK SYSTEMS



ALL ORDERS SHIPPED FROM STOCK ADD \$2.50 POSTAGE

> CER C n m p

5566 Ricochet Avenue Las Vegas, Nevada 89110

(702) 452-0632

Screen Enhancement Program Comparison Chart PROGRAM FEATURES HI-RES II HI-RES I BRAND X

NE
Upper/Lower case characters Yes
Mixed Text and Graphics
Separate Text & Graphics
Firit @ fully implemented
Print @ on all line lengths
Different line lengths
Sufferent line lengths
Automatic Key Repeat
Automatic Wes
Class Command Supported
X Y Coordinate Cursor
Positioning
Outle Size Characters
Individual/Continuous
Highlighting
On Screen Underlining
Clear Key functional

1 20 9 6 6 6 6 K Supported

Ves
Clear Key functional

1 20 1 2 6 6 6 K Supported

Ves OLD Yes Yes Yes 51 only 51 only (1) Yes Buff/Biack Buff/Black Buff/Black Yes Yes Clear/L keysClear key Yes Yes Clear Key functional 16.32 & 64K Supported Green or Black Background Color Green or Black Background
Color
Ves
Dual Character sets for
Enhanced 64 and 85
Characters per line display Yes
Protected Screen Lines
(programmable)
Full Control Code Reyboard
for Screen control directly
from the keyboard
Yes
Programmable Tab Character
Spacing
Yes
Full Screen Reverse Function Yes
Switch to & from the Standard
16 by 32 Screen for full
compatability
On Error Goto Function
No
Estended Basic Required
No
All Machine Language ProgramYes
RAM Required in addition to
Screen RAM
Program Price (Tape) No No No No No No No No 2K \$19.95 2K \$29.95





VISA, MASTERCARD AND C.O.D. ACCEPTED





DRACONIAN

You brace yourself as your ship materializes in the enemy sector. Your engine roars to life, and you consult the long-range scanner for the position of the nearest enemy base. As you head for the base, blasting asteroids and space-mines in your path, you suddenly notice a monstrous space-dragon looming before you. Reacting quickly, you dodge his deadly fire-breath and blast him out of existence.

This is it - the single most impressive, awe-inspiring arcade game you can buy for your Color Computer. High-resolution graphics, awesome sound effects, four-voice music, and quality you have to see to believe! Experience the realism of DRACONIAN today!

JOYSTICKS REQUIRED 32K MACHINE LANGUAGE TAPE \$27.95 DISK \$30.95



SR-71

SR-71 is a fast action game in which you are the pilot on a mission to take photographs of missile sites in Russia and deliver them to our processing laboratory in Japan. So real you will feel as if you are in the cockpit on a real spy mission. Elude Russian missiles as well as their detection devices. Another Tom Mix exclusive. A must for the adven-turous. Fantastic graphics, color and sound. 32K Ext. Basic.

TAPE \$28.95 DISK \$31.95



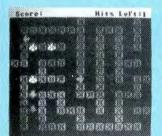
WORLDS OF FLIGHT (WOF) is a "view" oriented flight simulation for the TRS-80 Color Computer, written entirely in Machine Language. "View" oriented means that the pilot may determine his or her position by actually viewing the surrounding landmarks as opposed to using instruments which sense navigational references. This is a major departure from "instrument only" simulations which can be achieved through BASIC programs. Most instrument maneuvers and procedures may be practiced. The craft is a light-weight, single-engine airplane with low wings. A nose wheel which is both steerable and retractable is also modeled. Some aerobatics are possible including sustained inverted flight, aileron rolls, spins and stalls.

JOYSTICKS REQUIRED 32K MACHINE LANGUAGE TAPE \$29.95 DISK \$32.95









WAREHOUSE MUTANTS

Journey through the warehouse seeking out the Mutants who are out to destroy you. WATCH OUT! They will push crates trying to crush you! Outstanding realism-high resolution graphics-multiple screens.

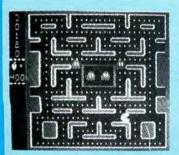
JOYSTICKS REQUIRED 16K MACH, LANGUAGE **TAPE \$24.95 DISK \$27.95**

QUIX

This one is after a popular arcade game with a similar name. Simply frustrating-you'll love it. Done in high resolution graphics with Super Sound.

JOYSTICKS REQUIRED 32K MACH, LANGUAGE **TAPE \$24.95 DISK \$27.95**





MS. MAZE

MS. MAZE is remarkable in that it combines brilliant color, high resolution, detailed graphics, and music with a very playable game. Anything that could be done to make the Color Computer look and play like the ar-cade version has been done. MS. MAZE is without question the closest thing to the arcade Pac games that I have seen for the Coco.

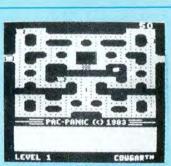
JOYSTICKS REQUIRED

32K MACHINE LANGUAGE TAPE \$24.95 DISK \$27.95

PAK-PANIC

Pakman is steered thru a maze eating dots and powerpills. Pakman is pursued by four monsters who try to catch and kill him. If Pakman eats a powerpill he becomes powerful and can eat monsters. Monsters try to avoid a powerful Pakman. As monsters are eaten their ghosts appear on the top of the screen. When seven ghosts have appeared one will fly across the screen or they will link together forming a centipede that will travel thru the maze. Pakman has no power against ghosts and centipedes and must avoid them or be killed. JOYSTICKS REQUIRED
32K MACHINE LANGUAGE

TAPE \$24.95 DISK \$27.95



PAK TWINS BOTH MS. MAZE & PAK PANIC FOR ONLY

44.90 TAPE 50.90 DISK



TOM MIX SOFTWARE

4285 BRADFORD N.E. GRAND RAPIDS, MI 49506

 ADD \$2.50 POSTAGE & HANDLING • (CANADA ADD \$3.00) • MICHIGAN RESIDENTS ADD 4% SALES TAX •

LOOKING FOR NEW SOFTWARE TOP ROAALTIES PAID (616) 957-0444

WRITE FOR FREE CATALOGUE - MOST OF OUR INVENTORY IS NOT SHOWN HERE!

"QUALITY EDUCATIONAL SOFTWARE" **VOCABULARY MANAGEMENT SYSTEM**

16K Extended basic/32K for printer output

The Vocabulary Management System (VMS) is a series of programs designed to aid a parent or teacher in helping children to learn and practice using vocabulary and spelling words. The 11 programs that comprise the VMS include a full feature data entry/edit program, three printer output programs and 5 vocabulary/spelling game programs. The system's many outstanding features include:

- -As many as 300 vocabulary words and definitions may be in the computer's memory at one time.
- Words and definitions may be saved on disk or tape.
- Remarks and/or comments can be saved with word files.
- -A disk loading menu allows students to load disk files without typing file names.
- —Word lists may be quickly alphabetized.
- The three printer segments allow you to create and print individualized tests. puzzles, word-searches and worksheets.

TAPE \$39.95 DISK \$42.95

- -The printer segments allow full use of your printer's special features.
- The 5 game programs are based on sound educational principles and provide practice in identifying words and matching them with their definitions in a fast-paced set of activities.

FRACTIONS - A Three Program Package - 32 K EXT. BASIC TAPE \$30.95 DISK \$35.95

MIXED & IMPROPER

- Review converting mixed numerals and improper fractions.

- Practice converting mixed numerals to improper fractions.

 Practice converting improper fractions to mixed numerals.

 Practice of both types, (Mixed to improper & improper to mixed)
- Review converting mixed numerals to mixed numerals.
 (Used in regrouping in substraction)
 Practice converting mixed numerals to mixed numerals.

- **EQUIVALENCE**
- 1. Definitions of terms and review of finding equivalent fractions. Practice finding equivalent fractions.
- Practice finding sets of equivalent fractions.

 Review of finding if one fraction is equal to, not equal to, less than or greater than another.
- 5. Practice finding if one fraction is equal to, not equal to, less than or greater than another

LOWEST TERMS

- Review of placing fractions into lowest terms by finding the greatest common factor (GCF) of the numerator and denominator.
 Practice finding the GCF of pairs of numbers.
- Practice placing fractions into lowest terms by finding the GCF of the numerator and denominator.

TEACHER'S DATABASE

TEACHER'S DATABASE is a program designed to allow a teacher to keep a computerized file of information about his/her students. There are many features that make this program particularly attractive:

- . Information on as many as 100 students (or more) may be in the computer at one time.
- Each student may have as many as 20 (or more) individual items of data in his/her record.
 The program will run from cassette or disk.
 Cassette and disk files are completely compatible.

- The program is menu driven.

- Records may be easily changed, deleted, combined or added.
 Information about students may be numerical or text.
 Records may be quickly alphabetized.
 Records may be sorted by various criteria.
 Records may be reordered (ranked) based on test scores or other data.
- Data displayed during a sort may be printed on a printer or saved on disk or cassette as a new file.
- A full statistical analysis of data may be done and sent to the printer.
- Student test scores may be weighted.
 REQURES 32K EXT. BASIC

TAPE \$39.95 DISK \$42.95

MATH DUEL

MATH DUEL is a challenging mathematics game that pits you against the computer it a game of wits. You must use all of your knowledge of factors,

multiples and prime numbers to develop a strategy that allows you to gather more numbers and thus more points that than the computer.

The game is deceptively simple. You select the size of the playing field that is composed of from 8 to 100 numbers. You must then choose numbers that will give you the maximum number of points and the computer the least number of points. There are only 6 rules.

- 1. Any number that you chose must have at least one factor still on the playing field
- 2. You receive points equal to the face value of the number that you chose.
- The computer receives points equal to the face value of all of the remaining factors of the number that you chose
- All of the numbers that were awarded to you or to the computer are removed from the field.
- 5. The game continues until there are no numbers with factors remaining.
- At the end the computer receives points equal to the value of all of the
- remaining numbers. 32K EXT. BASIC **TAPE \$24.95** DISK \$29.95

ESTIMATE

ESTIMATE is a program designed to help children to practice estimating the answers to addition, subtraction, multiplication and division problems on the Color Computer, it has many features that make its use particularly attractive.

- . Up to 5 students may use the program at the same time.
- · There are 5, user modifiable, skill levels.
- · The acceptable percent error may be changed as a student's skill improves.
- · A timer measures the number of seconds used to answer each problem and the total time used for a series of problems.
- · If a problem has been answered incorrectly, the student is told the percent error and asked to try again.
- · If a problem is answered incorrectly a second time, the student is told the correct answer and the range of acceptable answers is displayed.
- · A report is given at the end of each set of problems that includes the number of problems done, the number of problems answered correctly on the first try and the average percent error.
- . The (BREAK) key has been disabled so that child will not inadvertently stop the program from running. REQUIRES 16K EXT. BASIC

DISK \$22.95 TAPE \$19.95

PRE-ALGEBRA I INTEGERS

INTEGERS is a series of four programs designed to give students practice in working with addition, subtraction, multiplication, division and the comparison of integers. It has many features that make a very valuable tool for introducing and/or maintaining skills.

- . Up to 4 students may use the program at the same time
- · There are 9, user modifiable, skill levels.
- · Students are given two opportunities to answer a problem
- · A detailed report of student performance, including number correct on first try, number wrong, total time used and percentage score, is presented at the end of a series of problems.
- . The programs will run on a 16K TRS-80 Color Computer with or without disk drive.

Four distinct problem formats are presented. The first presents problems in this format: -12 + -9 = ? The second program presents a problem with missing numerals in this format: -7 - ? = 18. The third program presents a problem with a missing sign: 8 - ?6 = 14. The last program asks the student to determine the relationship (=, ◄ or ►) between two statements 3 -9 (??) -4 -5.

> 32K EXT. BASIC **DISK \$33.95 TAPE \$28.95**

PRE-ALGEBRA II

The second PRE-ALGEBRA PACK is composed of two programs, EQUATION SOLVER AND EQUATION DUEL, that are designed to give students practice in using and solving equations. It has many features that make a very valuable tool for introducing and/or maintaining skills:

- · In both programs students may choose the range of numerical values that will be included in the equations so that the difficulty may change as their skill increases.
- . In EQUATION SOLVER the computer secretely generates a random equation, shows the numbers that it used in the equation and the answer and challenges the student to create his/her own equation that uses the same numbers and results in the same answer.
- . In EQUATION DUEL the student and the computer race to see who will be the first to create an equation from the same set of random numbers
- · Both programs give detailed reports of the student's and the computer's performance in creating and solving equations including time used, score and percentage correct.

32K EXT. BASIC **TAPE \$28.95** DISK \$33.95

TOM MIX SOFTWARE 4285 BRADFORD N.E. GRAND RAPIDS, MI 49506

ADD \$2.50 POSTAGE & HANDLING • (CANADA ADD \$3.00) •

MICHIGAN RESIDENTS ADD 4% SALES TAX

LOOKING FOR NEW SOFTWARE TOP ROAALTIES PAID (616) 957-0444



WRITE FOR FREE CATALOGUE - MOST OF OUR INVENTORY IS NOT SHOWN HERE!

Metric Industries



MODEL 101 INTERFACE 54.95

The Model 101 is a serial to parallel interface intended for use with a COCO and any Centronics compatible parallel input printer. The 101 has 6 switch selectable baud rates (300-9600). It comes with a "UL" listed power supply that can be unplugged from the interface if your printer supplies power (Most do). The 101 is only 4" x 2" x 1" and comes with all cables and connectors for your computer and printer.

MODEL 102 SWITCHER 35.95

The Model 102 has 3 switch positions that allow you to switch your computer's serial output between 3 different devices (modem, printers or another computer). The 102 has color coded lights that indicate the switch position. These lights also act as power indicators to let you know your computer is on. Supplied with the 102 are color coded labels that can be applied to your accessories. The 102 has a heavy guage anodized aluminum cabinet with non-slip rubber feet.

MODEL 103 COMBO 85.95

With the turn of a knob the model 103 switches your computer's RS232C serial port to any one of 3 outputs — 2 serial and 1 parallel. The serial ports may be used for modems, serial printers or even another computer. The parallel port can be used with any Centronics compatible printer. The 103 has the best features from the 101 and 102: color coded position indicator lights, 6 switch selectable baud rates, heavy anodized aluminum cabinet, "UL" listed power supply and many more.







The Model 101, 102 and 103 will work with any level COCO basic, any memory size 4K-64K and are covered by a 180 day warranty.

The Model 101 and 103 work with any standard parallel input printer including Gemini, Epson, Radio Shack, Gorillia, C.Itoth, Okidata and many others. They support basic print commands, word processors and graphic commands.

CASSETTE LABEL PROGRAM 6.95

This fancy printing utility prints 5 lines of information on pinfeed cassette labels. "Cassette Label" is menu driven and is very easy to use. It uses the special features of your printer for standard, extended or condensed characters. Each line of text is automatically centered. Before the label

is printed, it is shown on your CRT — enabling you to make changes if you like — then print 1, 2 or 100 labels. The program comes on tape and it is supplied with 24 labels to get you started. 16K ECB required.

OTHER ITEMS

High quality 5-screw shell C-10 cassette tapes \$7.50/dozen Hard plastic storage boxes for cassette tapes \$2.50/dozen Pin feed cassette labels \$3.00/100





(C) 1984 METRIC INDUSTRIES

To order call our 24 hour order line 513-677-0796 and use your VISA or MASTERCARD or request C.O.D.

Or send check or money order to: **METRIC INDUSTRIES**

P.O. BOX 42396 CINCINNATI, OH 45242 Free shipping on orders over 50.00. Ohio residents add 5.5% sales tax.

We manufacture these products. Dealer inquiries are invited.

version of the program. After all, we want to share your masterpiece with our readers

Entries should be submitted on good quality tape or disk, and it is best to make several saves, at least one of them in ASCII format. Unfortunately, we do not have the time to key in program listings. Please do not submit programs that have been submitted for publication to other magazines. Your entry must be postmarked by July 1, 1985 to be eligible for consideration, and should be addressed to "Adventure Contest Editor."

Complete documentation should be included with all entries, including thorough instructions on how to load and run all portions of the program. You should enclose a descriptive introduction setting the scene for the Adventure, as well as detailed and exact instructions on how to solve the puzzle—clues and hints are nice, but our judges, in their conscientious efforts to give equal consideration to all entries, sometimes get frustrated (we get stumped, too) and need help.

It is a good idea, too, to include your name, address and telephone number for any and all materials submitted, including the documentation, program disks and cassettes.

If you need an introduction to, or refresher course on Adventures, you may want to refer to our December 1984 issue which contains last year's winning entries, along with the judges' comments on many entries. Our February 1984 issue contained two helpful articles — "Recipe For Adventure," by Eric W. Tilenius, and "The Making Of An Adventure," by Bob Liddil. You also may want to refer to The Rainbow Book of Adventures, which contains 13 winning entries from our first contest and comments from the judges of that competition. And, in next month's issue, Eric Tilenius will provide a complete bibliography of RAINBOW's many Adventures and Adventurewriting tutorials, as well as his latest advice on how to create a winning entry.

Many of THE RAINBOW's generous advertisers again are donating some wonderful prizes, many of which are listed in a full-page ad on Page 41 in this issue for this year's contest. And, of course, the winning programs will be featured prominently in an upcoming issue of THE RAINBOW.

Good luck. We're looking forward to another great contest!



ANNOUNCING THE THIRD ANNUAL RAINBOW ADVENTURE CONTEST

Calling all veteran and novice Adventurers. The RAINBOW Adventure Contest is back by popular demand! Here's your chance to shine.

Your Adventure can encompass any setting you can imagine. Write it in 4K, 16K, 32K or 64K, in BASIC or machine language, graphics or traditional text-only style. No specific categories. Send it in. We simply want your best!

Watch for Adventure tutorials in upcoming issues of THE RAINBOW. Check back issues for dozens of articles on Adventures and sample games. The Rainbow Book of Adventures is another excellent source.

Originality counts plenty, as does proper attention to documentation. Include a complete solution to the Adventure, along with features and aspects that deserve the judges' attention. In writing the Adventure, don't pack so tightly that we can't LIST or LLIST an entire line. If the program includes machine language, fully-commented source code must be provided, as well as a working, assembled version of your program. After all, we do want to share your gem with our readers. Indicate the minimum system needed to run your program, i.e., 32K ECB. Your program should run on standard Radio Shack equipment with no special modifications required and should not rely on commercial software for its execution. Put the accompanying article, the documentation, complete loading instructions and cover letter on paper.

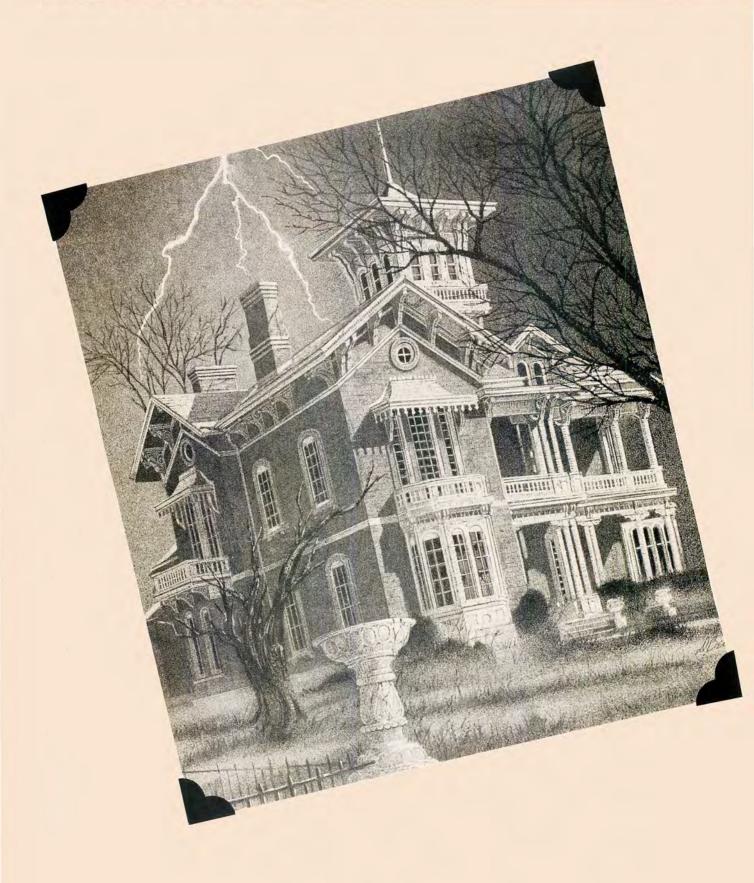
Include your name, address and telephone number on each page of all materials. It is mandatory that several saves of your Adventure be submitted on good-quality tape or disk; if it won't load, it will not be judged. We will not type in even the shortest of entries. Be sure to write-protect your disk or punch out the tabs on your tape to avoid accidental erasure and label each with the name of the program and your name and address. As in any contest, packaging does make a difference.

Above all, get your entry in by July 1, 1985 in bug-free condition. Each entrant will receive a free pass to the RAINBOWfest of his or her choice. You could win any of the prizes donated by these generous businesses.

Ankia Research	\$50 software of your choice.
Aurora Software	Stock Broker program.
	\$50 gift certificate.
Classical Computing	Adventure Cracker, Speak Up!
Cognitec	Telewriter-64.
Color Connection Software	Puzzler, Megamunk, 10Key.
Colorware	CoCo Max.
	DMP 105 Printer.
	Disk Sort & Order, Gemini Epson Screen Dump.
	Pro-Color-File series package.
Duggers Growing Systems	\$50 software of your choice.
E.A.P. Company	Gold Plug disk module.
Four Star Software	
Great Plains Computer Company	STYLO-Spell (OS-9 or FLEX).
Kelly Software Dist	\$50 software of your choice.
Microtech Consultants	XTerm, XWord, XMenu, XScreen (OS-9).
The Other Guy's Software	Keep-Trak, Bob's Magic Graphic Machine, AMT.
	\$100 software of your choice.
	\$50 gift certificate.
	CoCo Cooler.
Saguaro Software	Eagle & Sketchpad, both on disk.
Triad Pictures Corp	Animator series of four programs.
Valley Micro Systems	New BASTXT and New Disk Assembler.
Vidtron	Editron, Lister, Cross Ref, Bar Dumb.
Wasatchware	MLBASIC Compiler.
YGSUtility One, Utility One &	OS9 BASIC, Utility One & Two, plus OS9 BASIC.
and the second second second second second second second	ra i del transfera a rational a salama en encluara la competitar per per approprie

RULES: All programs must be original, unpublished and unmarketed works, no "conversions." Entries must be postmarked prior to July 1, 1985, and become the property of Falsoft, Inc., publisher of THE RAINBOW. Decision of the judges is final. Duplicate prizes will be awarded in the event of ties. Winning programs will be featured in a special RAINBOW Adventure issue. Address entries to "Adventure Contest Editor" and send to THE RAINBOW, 9529 U.S. Highway 42, P.O. Box 385, Prospect, KY 40059.







A Night Of Horrors In Lurkley Manor

By Richard Ramella

It's Halloween. You're locked in Lurkley Manor with an assortment of bizarre people and other unearthly things. You must use your skill and logic to escape the house without getting bumped off.

Lurkley Manor comes wrapped in a "fiendishly" long program listing which requires 32K and Extended Color BASIC. I hope you'll find the program worth the work, for it's an all-graphics logic puzzle with 16 scenes, 11 characters, animation and text in the Extended graphics mode. You will see the instructions when the program runs.

If your computer does not support the POKE 65495,0 "speed poke," you must delete it from lines 2 and 1830 of the listing.

If you wish the text to stay on the screen longer before erasing, in Line 2630 increase the timer loop from FDR T=1 TD 1000 to FDR T=1 TD 2000 or greater. The title sequence and instructions may be skipped by inserting GDTD 160: at the start of Line 120. Do not renumber lines 1 to 64; this will cause the program to work incorrectly.

A self-addressed, stamped envelope gets you the step-by-step instructions for escaping *Lurkley Manor*. Send your request to 1493 Mt. View Ave., Chico, CA 95926.

(Richard Ramella has written two books and numerous articles on TRS-80 topics. He is a writer for a California hospital.)

7	15 107	1330 122
7/	15 127	
	35 217	1450 110
1	62 18	156022
	180233	1710 237
	280247	1850163
1	38056	1980 235
	500190	2110205
1	61090	222039
	710121	231086
	79076	2400 121
	880144	2480153
	102088	258072
	1110115	END45
	1200 109	

The listing:

```
1 REM * LURKLEY MANOR * TRS-80 E
XTENDED COLOR BASIC / RAMELLA
2 CLEAR 500: POKE 65495,0
3 W$="DIRECTION?": DI$="NEWS": W
A$="YOU RUN INTO A WALL.": GOTO
100
4 X=X-6: RETURN
5 Z$="30353838": RETURN
6 Z$="10135053": RETURN
7 Z$="2029606903930797": RETURN
8 Z$="700000040474747979094049":
9 Z$="111179792970": RETURN
10 Z$="79000070700505090965": RE
TURN
11 Z$="3033": RETURN
12 Z$="402222272749": RETURN
13 Z$="406262676749": RETURN
14 Z$="43472424262664646666": RE
TURN
15 Z$="42481575": RETURN
16 Z$="2937": RETURN
17 Z$="2575": RETURN
18 ZS="4949": RETURN
19 Z$="7009": RETURN
20 Z$="60200108296978716228": RE
TURN
21 Z$="234040482959": RETURN
22 Z$="0220206060737375750707090
979": RETURN
23 Z$="0220206060737375753575787
86969292908": RETURN
24 Z$="000606765059": RETURN
25 Z$="7000000404646475757777595
9191908": RETURN
26 Z$="7020200202070729297979787
8757515": RETURN
27 Z$="00707009": RETURN
28 Z$="0110106060717173736464141
40303011405050808191969697878757
564": RETURN
29 Z$="7414140303010110106060717
178786969191908": RETURN
30 Z$="43434747": RETURN
31 Z$="43432937": RETURN
32 Z$="72050577": RETURN
33 Z$="12721575": RETURN
34 Z$="02757507": RETURN
35 Z$="0220206060717173736464343
4373939": RETURN
36 Z$="5634341414050507071818686
```

```
8777772725050111102": RETURN
37 Z$="0920205050797414": RETURN
38 Z$="0009096969787864640464737
37171606000": RETURN
39 Z$="7160601010010108081919696
978": RETURN
40 Z$="000909696975757272505000"
: RETURN
41 Z$="7000000909790565": RETURN
42 Z$="700000090565": RETURN
43 Z$="6010100101070729296969667
646": RETURN
44 Z$="000970790575": RETURN
45 Z$="206029694049": RETURN
46 Z$="70777759593939060604": RE
47 Z$="000905702379": RETURN
48 Z$="00090979": RETURN
49 Z$="0900004545707079": RETURN
50 Z$="090000797970": RETURN
51 Z$="1070707969190801": RETURN
52 Z$="0901107171746505": RETURN
53 Z$="10707079691908017956": RE
                                  O": NEXT V
THRN
54 Z$="090000707073736464040479"
: RETURN
55 Z$="70000004047474797909": RE | 1: CIRCLE(V+4,65),6,,2,.6,1: NEX
TURN
56 Z$="00704049": RETURN
57 Z$="000909797970": RETURN
58 Z$="00494970": RETURN
59 Z$="0029294545696970": RETURN
60 Z$="00790970": RETURN
61 Z$="004545704549": RETURN
62 Z$="007070090979": RETURN
63 IF Q$=CHR$(32) THEN RETURN
64 FOR H=1 TO LEN(Z$) STEP 4: LI
                                  E9D25"
NE(X+VAL(MID$(Z$,H,1)),Y+VAL(MID
$(Z$,H+1,1)))-(X+VAL(MID$(Z$,H+2
,1)),Y+VAL(MID$(Z$,H+3,1))),PSET
: NEXT: RETURN
100 PHODE 3,1: PCLS: SCREEN 1,1
110 P1$="L10;01;G;F;D#;D": P2$="
L10;G;G#;G;F;D#": P3$="L10;F;L4;
G": P4$="L4;D;L1;C": COLOR 3,0
                                   00
120 GOSUB 1740: GOSUB 2650: KZ=1
: GOSUB 1600
                                   : GOSUB 1530
130 A$="I AM, OF COURSE, IGOR. Y
OU ARE AN UNLUCKY FOOL NOW LOCKE
D IN LURKLEY MANOR.": GOSUB 1530
140 A$="TO TRAVEL, PRESS N FOR N
ORTH, E FOR EAST, W FOR WEST, S
                                  2,2: NEXT V
FOR SOUTH.": GOSUB 1530
150 A$="IN EVERY SCENE YOU FACE
NORTH.": GOSUB 1530: A$="FIND TH
E ATTIC TO ESCAPE... PERHAPS.":
                                  ; D5G3F3"
GOSUB 1530
160 GOSUB 2650: A$="THE GREAT HA
LL": GOSUB 1530: GOSUB 2510: GOS
UB 2520: GOSUB 2530
170 DRAW "BM100,95;U50L10U5R70D5
L10D50L50": CIRCLE(125,76),21,,1
.5,.4,.12: T1=90: B1=T1: PAINT(1
25,76),3,3
180 IF PW=0 THEN A$="IT IS EMPTY
 EXCEPT FOR A ROARING FIREPLACE.
": GOSUB 1530: PW=1
```

```
190 A$=W$: GOSUB 1530
200 FOR J1=3 TO 4: COLOR J1,0: L
INE(112+RND(25),93)-(112+RND(26)
,60-RND(5)),PSET: NEXT
210 X$=INKEY$: IF X$="" OR INSTR
(DI$, X$)=0 THEN 200
220 IF BU$="OK" AND X$="N" THEN BU$="": PA$="PA": A$="YOU DOUSE
THE FIRE AND ENTER": GOSUB 1530:
 PAINT(125,56),2,1: GOTO 2590
230 IF X$="N" THEN 1310 ELSE IF
X$="E" THEN 240 ELSE IF X$="W" T
HEN 880 ELSE AS="THE DOOR BEHIND
 YOU IS LOCKED. REMEMBER?": GOSU
B 1530: GOTO 200
240 GOSUB 2650: A$="SCULLERY": G
OSUB 1530: GOSUB 2510: GOSUB 252
0: GOSUB 2530: DS=180: GOSUB 254
250 FOR V=32 TO 168 STEP 2: DRAW
"C2; BM"+STR$(V)+",105;"+"U30;C3
;E10": NEXT V: FOR V=74 TO 104 S
TEP 2: DRAW"BM170,"+STR$(V)+";E1
260 FOR V=50 TO 75 STEP 25: CIRC
LE(V,70),10,1,.6: PAINT(V,70),1,
270 FOR V=140 TO 160 STEP 20: CI
RCLE(V,70),7,4,.6: PAINT(V,70),4
,4: NEXT: CIRCLE(153,65),20,3,.9
,.5,1: FOR V=50 TO 20 STEP -1: C
IRCLE(153,V),4,3,.7,.5,1: NEXT
280 CIRCLE(128,100),30,4,.3: PAI
NT(128,100),4,4: DRAW"C4;BH105,1
25;U20E9D25": DRAW"BM145,125;U20
290 IF QA=0 THEN QA=1: A$="A DOU
BLE SINK, AN OLD COOK STOVE AND
A BARE TABLE.": GOSUB 1530
300 A$=W$: GOSUB 1530: GOSUB 266
O: IF HY=1 THEN 1340 ELSE IF HY=
2 THEN 950 ELSE IF HY=3 THEN 160
ELSE A$=WA$: GOSUB 1530: GOTO 3
310 GOSUB 2650: A$="FLAGON ROOM"
320 CIRCLE(128,60),30,,2.5: DRAW
"Bi199,60; H25U35R110D35G25": PAIN
T(97,55),2,3: PAINT(160,55),2,3
330 FOR V=115 TO 142 STEP 27: CI
RCLE(V, 30), 10,,.6: CIRCLE(V, 30),
340 LINE(128,30)-(120,80), PSET:
LINE-(135,70), PSET: DRAW"BM120,9
0;G5H5R37G5H5": DRAW"C4;BM146,91
350 JH$="D60L30U60R30F20G20": IF
F1=0 THEN DRAW"C4; BM60, 74"+JH$:
 PAINT(55,80),4,4
360 IF F2=0 THEN DRAW"C3; BH210,7
4;"+JII$: PAINT(190,80),3,3
370 IF PY=0 THEN A$="GOOD EEFNIN
K! I AM COUNT DRACU- NEVER MIND
MY NAME!": GOSUB 1530: PY=1
380 IF F1=1 AND F2=1 THEN A$="1"
II OUT OF FLAGONS. GO AWAY.": GOS
UB 1530: GOTO 470
```

390 A\$="WANT A FLAGON OF POIS- I MEAN - DRINK AS YOU SEARCH? <Y> ES <N>0": GOSUB 1530 400 X\$=INKEY\$: IF X\$<>"Y" AND X\$ <>"N" THEN. 400 410 IF X\$="N" THEN A\$="GO AVAY!" : GOSUB 1530: GOTO 470 420 A\$="WHICH COLOR - <0>RANGE O R LUE?": GOSUB 1530 430 X\$=INKEY\$: IF X\$<>"O" AND X\$ <>"B" THEN 430 440 IF X\$="0" AND F1=0 THEN F1=1 : FL\$="ORANGE": LINE(25,73)-(85, 134), PRESET, BF: A\$="YOU GOT IT. NOW LEAVE.": GOSUB 1530: GOTO 47 450 IF X\$="B" AND F2=0 THEN F2=1 : FL\$="BLUE": LINE(170,73)-(230, 134), PRESET, BF: A\$="YOU'RE WELCO ME I'M SURE. NOW RUN BEFORE THE FULL MOON RISES!": GOSUB 1530: G OTO 470 460 IF X\$="B" AND F2=1 THEN A\$=" SURELY IT'S OBVIOUS THAT'S A FRU ITLESS GUESS. DEPART LEST I BITE YOU!": GOSUB 1530: GOTO 470 470 A\$=W\$: GOSUB 1530: GOSUB 266 0: IF HY=1 THEN 880 ELSE A\$=WA\$: GOSUB 1530: GOTO 470 480 GOSUB 2650: A\$="DINING ROOM" : GOSUB 1530: GOSUB 2510: GOSUB 2520: DS=170: GOSUB 2540 490 DRAW"BM236,60; D31H6U25E6D5F6 G6": GOSUB 2670 500 DRAW "C2; BM60, 120; U40L5U5R10 5D5L5D40L5U35L85D35L5": PAINT(62 ,118),2,2 510 FOR V=60 TO 160 STEP 30: CIR CLE(V,71),8,4,.4,1,.5: FOR U=1 T 0 4: CIRCLE(V+RND(2)-1,70),RND(5) :RND(3)+1: NEXT U,V 520 IF OZ=1 THEN OZ=0: GOTO 560 ELSE AS="THAT FOOD LOOKS GOOD. W ANT A SNACK? <Y>ES OR <N>O.": GO SUB 1530 530 X\$=INKEY\$: IF X\$<>"Y" AND X\$ "N" THEN 530 ELSE IF X\$="N" TH EN 560 540 XZ=1: FOR V=50 TO 150 STEP 3 0: A\$=MID\$("SLURPSNORFSCHMFGASP" ,XZ,5)+"!": GOSUB 1530: LINE(V,6 0)-(V+18,74), PRESET, BF: PLAY "T1 28;05;CDECDE": XZ=XZ+5: NEXT 550 A\$="UII-OH! ANOTHER PIGGY BEC OMES A DINING ROOM VICTIM. THE E ND!": KZ=1: GOSUB 1530: GOTO 261 560 A\$=W\$: GOSUB 1530: GOSUB 266 0: IF HY=3 THEN GL=2 570 ON HY GOTO 580,1140,1440,880 580 GOSUB 2650: L=0: FOR V=135 T 0 40 STEP -10 590 DRAW "BM"+STR\$(L)+","+STR\$(V)+"U5R20D5L20U5E5R20G5" R\$(V)+"U5R20D5L20U5H5R20F5" 610 PAINT(234-T " C) 610 PAINT(234-L, V-2),3,3: PAINT(L+2, V-2), 4,3: L=L+5: NEXT

620 LINE(68,35)-(180,135), PSET, B : PAINT(65,133),4,3: PAINT(182,1 33),3,3 630 FOR V=80 TO 153 STEP 31: LIN E(V,5)-(V+25,35), PSET, B: NEXT 640 IF LK=0 THEN LK=1: A\$="YOU A RE AT TWO STAIRWAYS TOPPED BY TH REE DOORS.": GOSUB 1530 650 A\$="CHOOSE <L>EFT STAIR, <R> IGHT STAIR OR <S>OUTH.": GOSUB 1 530 660 X\$=INKEY\$: IF X\$="" OR INSTR ("LRS", X\$)=0 THEN 660 670 IF X\$="S" THEN 480 680 IF FL\$="ORANGE" AND X\$="L" O R FL\$="BLUE" AND X\$="R" THEN GOS UB 2630: GOTO 720 690 A\$="AS YOU NEAR THE TOP, THE ENTIRE ARRANGEMENT COLLAPSES.": **GOSUB 1530** 700 L=8: FOR K=1 TO 8: FOR V=36 TO 134 STEP L: LINE(2,V)-(253,V) , PRESET: NEXT V: L=L-1: NEXT K 710 A\$="IN YOUR NEXT LIFE, REMEM BER THE FLAGON AND STAIR COLORS



1820: GOTO 710 720 A\$="YOU ASCEND TO THE DOORS. OPEN <L>EFT, <M>IDDLE OR <RIGHT >. WHICH?": GOSUB 1530 730 X\$=INKEY\$: IF X\$="" OR INSTR ("LMR", X\$)=0 THEN 730 ELSE IF X\$ ="M" THEN 2130 740 GOSUB 2650: FOR V=0 TO 255 S TEP 85: LINE(V,0)-(V,135), PSET: NEXT 750 A\$="YOU SLOWLY OPEN THE DOOR .": GOSUB 1530 760 IF X\$="L" THEN GOSUB 1960 EL SE GOSUB 1840 770 IF X\$="L" AND FL\$="ORANGE" O R X\$="R" AND FL\$="BLUE" OR YO=0 AND X\$="R" OR YO=1 AND X\$="L" TH EN 2200 780 IF X\$="L" THEN YO=1: FL\$=FL\$ +"X": A\$="A FORBODING BUT FRIEND LY MUMBLY APPEARS. IT GESTURES OV ER THE BLUE FLAGON.": GOSUB 1530 : A\$="ITS ADVICE: SHARE THE POTA BLE WITH SOMEONE WHOSE NAME BEGI NS AS ITS COLOR.": GOSUB 1530: G OTO 800 790 Y0=Y0+1: FL\$=FL\$+"X": A\$="A

RATTLING SKELETON IS THERE.": GO SUB 1530: AS="IT TELLS YOU: SAY YES TO THE LADY.": GOSUB 1530 800 A\$="CONSIDERABLY WISER, YOU DESCEND THE STAIRS WITH YOUR FLA GON.": GOSUB 1530: GOTO 580 310 GOSUB 2650: A\$="YOU GET A WH IFF OF HAY.": GOSUB 1530 820 CIRCLE(128,65),70,,.8,.6,.1: CIRCLE(128,65),70,,.8,.2,.3: CI RCLE(128,65),70,,.8,.4,.5 830 DRAW "BM185,95; D30L22H9C1L46 C3G9L22U25": CIRCLE(205,58),12,, .7,0,.4 840 CIRCLE(55,45),20,,1,.3,.9: F OR V=19 TO 29 STEP 10: CIRCLE(V. 65),30,,1,0,.25: NEXT: CIRCLE(48 ,45),3 850 A\$="AN OBESE, DIM-WITTED ELE PHANT IS THERE.": GOSUB 1530: AS ="HAPPY TO SEE YOU, IT RUSHES FO RWARD IN GREETING...": GOSUB 153 860 IF BU\$="BU" THEN BU\$="OK": A \$="AND FILLS THE BUCKET WITH WAT ER FROM ITS TRUNK.": GOSUB 1530: A\$="IT TRUMPETS: GO DOUSE SOMET HING.": GOSUB 1530: GOTO 1340 870 PLAY "L4;01;C;04;L1;C": A\$=" AND STEPS ON YOU. YOU FEEL MIGHT Y LOW AS EVERYTHING ENDS. ": KZ=1 : GOSUB 1530: GOTO 2610 880 GOSUB 2650: AS="DRAWING ROOM ": GOSUB 1530 890 GOSUB 2510: GOSUB 2520: DS=4 6: GOSUB 2540: GOSUB 2670 900 IF YO<3 THEN GOSUB 1680 910 X=2: FOR V=80 TO 150 STEP 2: DRAW "C"+STR\$(X)+"; BI1"+STR\$(V)+ ,120;"+"U20E2R2E2R2E2R2U20E2R2E 2C2D40C3G5L3G5L3G5": X=X+1: IF X =5 THEN X=2: NEXT ELSE NEXT 920 IF YO<3 THEN GOSUB 2270 930 A\$=W\$: GOSUB 1530: GOSUB 266 O: IF HY=3 THEN GL=1 940 ON HY GOTO 480,160,1440,310 950 GOSUB 2650: GH=0: A\$="THE PA RAPET": GOSUB 1530 960 FOR I=64 TO 129 STEP 5: N1=N 1+1: IF N1/2=INT(N1/2) THEN V=1 ELSE V=5 970 FOR G=V TO V+200+RND(20) STE P 10: LINE(G,I)-(G+10,I+5), PSET, B: NEXT G, I 980 FOR V=2 TO 80 STEP 2: CIRCLE (V,63),20,4,1,.5,.75: CIRCLE(V,6 3),12,3,1.8,.77,1: NEXT 990 IF JL=O THEN AS="AN ARCHED W ALKWAY OPENS ON A CRUMBLING BRIC K WALL.": GOSUB 1530: JL=2 1000 A\$="IT'S HUNDREDS OF FEET D OWN -- SOUTH, EAST AND NORTH.": GOSUB 1530: A\$=W\$: GOSUB 1530: K Z=1: GOSUB 2660 1010 KZ=0: IF HY=3 THEN 240 1020 IF GH=1 AND PA\$="PA" THEN 2 550

1030 IF GH=1 THEN CIRCLE(220,33)

,10,1,.5,0,.5: CIRCLE(220,40),10 ,2,.5,.5,0: A\$="YOU JUMP.": GOSU B 1530: A\$="YOU FOOL!": GOSUB 15 30: FOR VB=240 TO 1 STEP -5: SOU ND VB,1: NEXT VB: A\$="THE END": KZ=1: GOSUB 1530: GOTO 2610 1040 CIRCLE(220,60),26,2,2,.5,1: DRAW"C2; B11200, 60; E5F5E5F5E5F5E5 1050 CIRCLE(220,33),10,,.5,0,.5: CIRCLE(213,25),5: CIRCLE(228,25 1060 GH=1: A\$="A GHOST APPEARS I N MID-AIR, SAYING ... RECONSIDER! GO WEST OR BE AS I!": GOSUB 153 0: GOTO 1000 1070 GOSUB 2650: A\$="LABORATORY" : GOSUB 1530: GOSUB 2510: GOSUB 1080 FOR V=40 TO 80 STEP 10: FOR V1=100 TO 140 STEP 10: LINE(V1, V)-(V1+10,V+10), PSET, B: NEXT V1, V: DRAW"C1; B1160, 40; R20": DRAW"B11 50,95;R40" 1090 COLOR 2,1: LINE(170,120)-(2 15,134), PSET, BF: LINE(175,70)-(2 10,119), PSET, B: COLOR 3,1: GOSUB 1890: DRAW"C1; BM176, 95; R33" 1100 DRAW"C2; BM190, 90; E10H10E10H 10E10H10L63D9" 1110 A\$="PROFESSOR FUDDLES PERFO RMS UNSPEAKABLE EXPERIMENTS ON S MALL HELPLESS AMOEBAS.": GOSUB 1

530 1120 FOR V=1 TO 100: PAINT(101+R ND(42),43+RND(43)),RND(2)*2,3: P SET(176+RND(34),71+RND(48),RND(2)*2): SOUND RND(240),1: NEXT 1130 AS=WS: GOSUB 1530: GOSUB 26 60: IF HY=2 AND CV=1 THEN CV=0: GOSUB 2100: GOTO 1070 ELSE IF HY =3 THEN 1340 ELSE A\$=WA\$: GOSUB 1530: A\$="THIS GIVES YOU A CHANC E TO WATCH SOME MORE AS ... ": GOS UB 1530: GOTO 1110 1140 GOSUB 2650: A\$="FLAGON SPIL LING ROOM": GOSUB 1530 1150 GOSUB 2510: FOR V=1 TO 100: PSET(RND(253)+2,RND(133)+2,2): NEXT V 1160 AS="THERE ARE STRANGE SMALL THINGS ALL AROUND.": GOSUB 1530 1170 IF FL\$<>"ORANGE" AND FL\$<>" BLUE" THEN 1290 1180 A\$="THIS IS THE FLAGON SPIL LING ROOM. YOU HAVE A FLAGON. YO U SPILL IT.": GOSUB 1530: A\$="TH

U SPILL IT.": GOSUB 1530: A\$="TH E FUMES REANIMATE MUMMIFIED SPID ERS WHICH GROW HUGE AND ATTACK." : KZ=1: GOSUB 1530: PCLS 1 GE. T-II 1190 DIM A(1,25),B(7): PCLS 1: C IRCLE(15,14),3,,.5: CIRCLE(15,10 1330 A\$: LOCKED.

1200 FOR V=8 TO 23 STEP 5: V\$=ST

R\$(V)+",17;": IF V=<16 THEN J\$="

G5F5" ELSE J\$="F5G5" 1210 DRAW "BM"+V\$+J\$: NEXT V: PS ET(11,7,4): PSET(18,7,4) 1220 GET(2,2)-(33,33),A,G: PCLS 1230 X=RND(7)-1: P=X*36+8: FOR J =1 TO RND(25): B(X)=B(X)+11240 PUT(P,B(X))-(P+31,B(X)+25), 1250 IF B(X)>110 THEN 1270 1260 NEXT J: GOTO 1230 1270 A\$="OH WHAT A SAD ENDING!": GOSUB 1530: PAINT(0,0),4,3: COL OR 1,1: A\$="E-E-E-E-E-K!": KZ=1: X=64: Y=160: GOSUB 1540 1280 PLAY "T1": GOSUB 1820: GOTO 1280 1290 A\$="YOU'RE VERY LUCKY . . . FOR SOME REASON": GOSUB 1530 1300 GOSUB 2650: A\$="DIRECTION?" : GOSUB 1530: GOSUB 2660: IF HY= 3 THEN 480 ELSE A\$=WA\$: GOSUB 15 30: GOSUB 2660: GOTO 1140 1310 A\$="YOU WALK DIRECTLY INTO THE FIREPLACE.": GOSUB 1530 1320 A\$="YOU MUST THINK THIS TES T IS A CINCH. FOR YOU IT'S A SIN GE. T-II-E E-N-D": GOSUB 1530: GO 1330 A\$="THE DOOR BEHIND YOU IS LOCKED. REMEMBER?": GOSUB 1530: GOTO 160 1340 GOSUB 2650: A\$="GYMNASIUM":





SALE



Computer Recorder Panasonic39.95

COLOR COMPUTERS*

CHEAPEST

THE COMPUTER CENTER

901-761-4565, 5512 Poplar, Memphis, TN 38119

Add \$4.90 for shipping & handling on Computers & Printers, \$2.80 on any other items-per order. Visa & M/C Accepted

GOSUB 1530: GOSUB 2510: GOSUB 2 1350 PAINT(228,101),3,3: DS=100: GOSUB 2540: GOSUB 2030: IF YO=3 THEN GOSUB 2490: GOTO 1400 1360 IF BU\$="BU" AND SD=0 THEN S D=1: A\$="BLURTON SAYS: GO SEE TH E ELEPHANT.": GOSUB 1530: GOTO 1 400 1370 IF VX=0 THEN VX=1: A\$="SMIR KING BUT SILENT, BLURTON SHARPE PRACTICES HIS PISTOL SKILL.": GO SUB 1530 1380 GOSUB 2490 1390 E\$=LEFT\$(FL\$,1): IF E\$="B" OR E\$="O" THEN GOSUB 2440 1400 A\$="DIRECTION?": GOSUB 1530 : GOSUB 2660: IF PI\$="" AND HY=1 OR PI\$="" AND HY=3 THEN A\$="YOU ENTER SHARPE'S LINE OF FIRE, AN D HE PLUGS YOU. THE END.": GOSUB 1530: GOTO 2610 1410 IF PI\$="EMPTY" AND HY=1 THE N 810 1420 IF PI\$="EMPTY" AND HY=3 THE N A\$=WA\$: GOSUB 1530: GOTO 1400 1430 IF HY=4 THEN 240 ELSE IF HY =2 THEN 1070 1440 GOSUB 2650: FOR V=1 TO 79 S TEP 3: CIRCLE(128,55), V, RND(2)+2: NEXT V 1450 A\$="THIS MEANS JUMPING THRO UGH A BEAUTIFUL STAINED GLASS WI NDOW. <Y>ES OR <N>O": GOSUB 1530 1460 X\$=INKEY\$: IF X\$<>"Y" AND X \$<>"N" THEN 1460 ELSE IF X\$="N" AND GL=2 THEN 560 ELSE IF X\$="N" AND GL=1 THEN 930 1470 DRAW"C2; BM128, 40; U30G10D20H 30D10F20L30F20G30R5U5R13U5E20F40 U10R40H40U30G20": PAINT(128,65), 1,2 1480 FOR X=255 TO 1 STEP 10: SOU ND X,1: NEXT: A\$="YOU JUMP": GOS UB 1530 1490 IF PA\$="PA" THEN A\$="YOUR P ARACHUTE RIPS ON JAGGED GLASS AN D IS USELESS.": GOSUB 1530 1500 A\$="IT'S THE END. YOU FALL . . . ": GOSUB 1530 1510 AS="... AND FALL ...": GOSU B 1530: GOSUB 1820: GOTO 1510 1520 IF FI=2 THEN DRAW"C3; B11200, 74"+JII\$: PAINT(180,80),3,3 1530 COLOR 3,1: X=1: Y=140: A\$=A \$+CHR\$(32) 1540 FOR P=1 TO LEN(A\$): Q\$=MID\$ (A\$, P, 1)1550 K=ASC(Q\$)-31: IF K<1 OR K>5 9 THEN 1590 1560 ON K GOSUB 4,5,6,7,8,9,10,1 1,12,13,14,15,16,17,18,19,20,21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32 ,33,34,35,36,37,38,39,40,41,42,4 3,44,45,46,47,48,49,50,51,52,53, 54,55,56,57,58,59,60,61,62 ,1): DRAW "B11210,16;D3": DRAW "B 1570 GOSUB 63: X=X+12: IF Q\$=CHR

\$(32) AND INSTR(MID\$(A\$,P+1,INT((255-X)/12), CHR\$(32)=0 THEN X= 1: Y=Y+14 1580 IF Y>182 THEN GOSUB 2630 1590 NEXT P: GOSUB 2630: RETURN 1600 CIRCLE(128,90),55,,1.5,.6,. 09 1610 FOR V=120 TO 128: FOR U=110 TO 170 STEP 60: CIRCLE(U,V),15, ,.2: NEXT U,V 1620 CIRCLE(155,75),18,,2.5,.5,1 : DRAW"BM137,75;R30": CIRCLE(157 ,75),13,,1,0,.5: CIRCLE(85,97),1 1,,1,0,.5 1630 DRAW "BM155,120;H15G15L20H8 U15L20U22" 1640 CIRCLE(100,62),30,,.8 1650 FOR V=90 TO 110 STEP 20: CI RCLE(V,55),9,..7: CIRCLE(V,58),3: NEXT 1660 DRAW "Bi1101,55; D3G7D5F3R2E5 U2" 1670 LINE (97,80)-(107,77), PSET: 1680 COLOR 2,1: CIRCLE(200,130), 20,,3,.5,0: LINE(180,130)-(220,1 30), PSET 1690 DRAW "BH195,75; U6L1H3U6E3R3 F4E4R2F3D6G3D6G3" 1700 LINE(200,120)-(200,70), PRES ET: PAINT(200,112),2,2 1710 CIRCLE(200,40),9,,1.6: CIRC LE(200,66),16,,1.1,.35,.16: PAIN T(200,40),1,21720 PSET(198,37,3): PSET(202,37 ,3): CIRCLE(200,41),1: CIRCLE(20 0,44),2,.7,0,.51730 COLOR 4,0: FOR V=10 TO 14: CIRCLE(200,46), V,, 1.7,.5,1: NEXT : COLOR 3,0: RETURN 1740 PMODE 4,1: COLOR 1,0: PCLSO : SCREEN 3,2 1750 DRAW"BMO, 134; E10R3U2E5R40U3 R50U3R150" 1760 LINE(116,110)-(90,30), PSET 1770 DRAW"BN190,30;L10U10R40D10L1 OD10R40U10L5U5R15D5L5D10R30U20L1 OU8R30D8L10D20R40" 1780 LINE-(220,111), PSET 1790 FOR V=1 TO 12: CIRCLE(180,1 11), V,, 2,.5,1: NEXT 1800 FOR V=1 TO 10: CIRCLE(30,20), V: NEXT 1810 KZ=1: A\$=STRING\$(9,32)+"LUR KLEY MANOR"+STRING\$(11,32)+"BY R ICHARD RAMELLA": GOSUB 1530: KZ= 1820 POKE 65494,0: POKE 223,6: F OR G=1 TO 2: FOR T=1 TO 2: PLAY P1\$: NEXT T: PLAY P2\$: IF G=1 TH EN PLAY P3\$ ELSE PLAY P4\$ 1830 NEXT G: POKE 65495,0: RETUR 1840 PAINT(220,5),3,3: COLOR 1,3 : CIRCLE(210,16),11,,1.5,.45,.05 6: CIRCLE(210,19),9,,2.2,0,.5 1850 PSET(208,11,1): PSET(213,11

11209,24;R4" 1860 DRAW "Bii190,69;U10R3U17E5R2 5E15U3H10": DRAW "BM210,34;D40" 1870 V1=14: V2=.7: V3=47: FOR V= 1 TO 5: CIRCLE(210, V3), V1,, V2,.4 5,.05: V1=V1-2.5: V2=V2-.1: V3=V 3+5: NEXT V 1880 FOR V=67 TO 70: CIRCLE(210, V),14,,.6,0,.5: NEXT: DRAW"BM188 ,132;E7U10H3U30E7R20F20G20F7": R ETURN 1890 CIRCLE(70,90),25,,1.5,.45,. 99: CIRCLE(80,90),25,,1.5,.5,.6: CIRCLE(53,95),7 1900 DRAW"BM48,103;D15G5R10E2R5E 10" 1910 CIRCLE(68,85),18,,1.6,.75,. 1920 CIRCLE(70,47),15,,1.2: DRAW "BM80,51;L4H2": CIRCLE(76,41),3 1930 FOR V=5 TO 16: CIRCLE(72,47), V,, 1.2,.5,.7: NEXT V 1940 DRAW "BM63,120; D14R17E2U4H2 L5U5E2U5E7U2E7U3E2U1E2U7L9": PAI NT(65,132),3,3 1950 PAINT(70,100),4,3: RETURN 1960 FOR V=21 TO 145 STEP 1: LIN E(6,V+(RND(10)-20))-(75,V+RND(10))-20), PSET: NEXT V: COLOR 3,0 1970 COLOR 2,0: DRAW "BM35,80;D5 OL20U10R10U80G10D30L10U35E20R5" 1980 CIRCLE(39,17),14,,1,.4,.12 1990 DRAW "BH35,80;R10D50R20U10L 10U80F10D30R10U35H20L5" 2000 LINE(0,0)-(85,135), PSET, B: PAINT(5,5),4,2: PAINT(5,5),1,2 2010 COLOR 3,0: LINE(0,0)-(85,13 5), PSET, B: PAINT(5,5),1,3 2020 RETURN 2030 COLOR 2,1 2040 DRAW"BI1202,130;L13E4R5U75G1 2H15R7F7E11R20F15G15U7E7H9D75G8L 3U4E6R4L13R7U40": DRAW "BH199,70 ;R15" 2050 PAINT (202,68),2,2: PAINT (202,72),4,2 2060 CIRCLE(206,33),10,,1.3: PAI NT(206,33),0,2: PAINT(206,33),1, 2: COLOR 2,0: FOR V=1 TO 10: CIR CLE(206,28), V,,.8,.5,1:NEXT V: C OLOR 3,0 2070 DRAW "BI1203, 37; F2R3E2": DRA W"BM207,36;U4": PSET(202,30,3): PSET(209,30,3) 2080 DRAW"BM173,47;U1L10U1R13E2G 3D7" 2090 DRAW"BM10,125;U5E5U50L5D15L 3U20R10U10R10D10R10D20L5U15L5D38 F3G10U25": RETURN 2100 GOSUB 2650: BU\$="BU": A\$="D UNGEON": GOSUB 1530: GOSUB 2510: A\$="IT'S EMPTY EXCEPT FOR...": GOSUB 1530 2110 DRAW"C2; BM195, 103; R20D30L20 U30": PAINT(197,105),2,2: CIRCLE (205,103),10,2,.5,1: A\$="A NICE LITTLE BUCKET": GOSUB 1530

BO MAN

This is one of those rare programs that will captivate everyone in your family....
No one can see CoCo Max and not want to try it!



We are all witnessing an exciting revolution in microcomputers: a radically new kind of computer and software that opens a whole new world of creative power to computer users.

It was inevitable that this exciting approach would be brought to the CoCo. With this in mind, Colorware chose to go all out and maximize this new concept for the color computer. That meant designing not just software but hardware too. It meant thousands of hours of pure machine language programming. Rarely has this much effort been applied to one product for the Color Computer.





UNMATCHED CAPABILITY...

Because we took the maximum approach: highly optimized machine code combined with hardware, CoCo Max truly stands above the rest as the ultimate creative tool for the Color Computer. It's unrivaled performance lets you create with more brilliance and more speed than any similar system — much more than you ever imagined possible. And, you can do it in black & white or color.



All the sophisticated power of the bigger systems is there: *Icons, Pull-Down Menus,* full *Graphic Editing, Font Styles,* and all kinds of handy tools and shortcuts.

Plug your joystick, mouse or touch pad into CoCo Max's Hi-Res Input Unit. Then use a delightfully simple *Point-and-Click* method to get any of CoCo Max's powerful graphic tools. It has them all:

You can Brush, Spray or Fill with any Color, Shading or Pattern. Use Rubber Band Lines and Shapes (square, rectangle, circle, elipse, etc.) to create perfect illustriations with speed and ease. There's a Pencil, an Eraser and even a selection of Caligraphy Brushes. And, as you can see. CoCo Max can do a lot with text. All of the newest special effects are there: Trace Edges, Flip, Invert, Brush Mirrors, etc. And all of the very latest supercapabilities like: Undo, which automatically reverses your mistakes, and Fat Bits which zooms you way in on any part of your subject to allow dot-for-dot precision.



THE BIG PICTURE

The large image box in the middle of the CoCo Max screen is actually only a window on an even larger image. Use the Point-and Click "Hand" to effortlessly move your window over any portion of the larger image. You have a working area of up to 3-½ times the area of the window itself.

FLEXIBLE PRINTING...

CoCo Max gives you many ways to print. Fill a whole page with your image or condense two full CoCo screens to less than ¼ page for a finely detailed copy. "Dump" your CoCo Max screen full size or shrink it to ½ page size.

FREEDOM TO CREATE...

Anyone who wants to create anything at all on their CoCo screen or printer will certainly be very glad to meet CoCo Max. CoCo Max's friendly yet sophisticated graphic and text capabilities let you almost instantly produce illustrations, diagrams, charts,



graphs, and computer art – for serious use or just for creative fun.



tion by using software schemes such as sliding windows. Although clever, these schemes yield sluggish and awkward results. Only CoCo Max does it the right way. The CoCo Max Hi-Res Input Unit plugs into your ROM slot and adds an entirely new joystick input to your computer — a precision one with a 49,152 point resolution to match the CoCo screen exactly.

Plug your same joystick, mouse or touch

You may then use CoCo Max's graphic magic on it. The DS-69 is available as an option from Colorware from \$149.95 complete with its own software on disk or tape. Using the DS-69 with a disk requires an RS multi-pak adaptor.



COCO MAX REQUIREMENTS

The CoCo Max System includes the Hi-Res Input Unit, software on disk or cassette (please specify) and user manual. It will work on any 64K Extended or non-

THE COCO MAX SYSTEM

AN ABSOLUTE GUARANTEE

CoCo Max is a hardware software system that no software-only system can match. Get CoCo Max and see your CoCo perform as it never could before. If you don't agree that CoCo Max is the ultimate creative tool for the Color Computer, simply return it within 20 days for a full, courteous return from Colorware.

THE HARDWARE...

This is the key to CoCo Max's unmatched performance. Did you know the normal joystick input built into the Color Computer only allows access to 4,096 (64 x 64) points on the CoCo screen? Yet, the Color Computer's high resolution screen.



has 49,152 (256 x 192) pixels. This means that a joystick, mouse or even a touch pad can, at best, only access about one tenth of the pixels on the CoCo screen.

Most graphic programs ignore this hardware limitation of the Color Computer and give you only low-res control. Others attempt to overcome the limitapad into this new input and you have a whole new kind of control. The difterence is remarkable.



A DIGITIZER OPTION...

We studied all the video digitizers available and picked the best of them to link with CoCo Max. The DS-69 from Micro Works was our choice. This optional device lets you capture the image from any video source (video recorder, camera, etc.) on your Color Computer.



extended Color Computer. You'll need a Radio Shack or equivalent joystick, mouse or touch pad. Disk systems require a Multi-Slot Interface or Y-Branching Cable.

THE COMPLETE COCO MAX SYSTEM, with software on DISK............\$69.95

Y-BRANCHING CABLE-If you have a disk system but do not have a Multi-Slot Interface, use this economical 40-pin, 1 male, 2 female cable to connect the CoCo Max Hi-Res input unit and your disk controller to your CoCo.....\$27.95

COLORWARE

TOLL FREE ORDER LINE: (800) 221-0916

Colorware Inc. 78-03F Jamaica Ave. Woodhaven, NY 11421 (718) 647-2864



ORDERING INFORMATION

ADD \$3.00 PER ORDER FOR SHIPPING AND HANDLING. C.O.D.'S ADD \$3.00 EXTRA. SHIPPING AND HANDLING FOR CANADA IS \$5.00 WE ACCEPT VISA, MASTER CARD, M.O.'S, CHECKS. N.Y. RESIDENTS MUST ADD SALES TAX.

THE TOP 4 COCO GAMES...

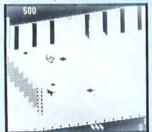


CUBIX

By Spectral Associates. Very much like the arcade smash! Jump little Cubix around the 3D maze trying to change the color of all the squares. With Death Globes, Discs, Snakes, etc. 32K Tape: \$24.95

ZAKSUND

From Elite Software comes this fantastic arcade style space action game with 3 different stages of moving 3-D graphics. You've never seen anything like this on your CoCo! Great sound too! 32K Tape: \$24.95





THE KING

Previously called 'Donkey King', you simply cannot buy a more impressive game for your CoCo. With 4 different screens and loads of fun! From Tom Mix Software. 32K Tape: \$25.95

GHOST GOBBLER

From Spectral Assoc. This "PAC" theme game has been improved several times. It is definitely the best of its type. Brilliant color, action and sound, just like an arcade. 16K Tape: \$24.95



COLORCADE SUPER JOYSTICK MODULE



JOYSTICK INTERFACE/RAPID FIRE/6 FT. EXTENDER ALL IN ONE! The Colorcade allows connection of any Atari type joystick to your CoCo (including the Wico Red Ball). These switch type sticks are extremely rugged and have a faster and more positive response. They will improve the play of almost any action game.

An adjustable speed rapid fire circuit is built in. Press your fire button and get a great burst of fire instead of just a single shot! You get a real advantage in shooting games that do not have repeat fire.

ATARI JOYSTICK



CAN BUY WICO #15-9730



WICO FAMOUS
"RED BALL"

ROM/PROJECT/ PRODUCT CASE



Give a professional look to your project or product! High quality 3 piece injection molded plastic with spring loaded door. Designed especially for the CoCo ROM slot.

2		4	pc	s.		,		,	,			,						÷	,		,			,	\$5.50	Ea.
5		9	pc	s.	,		À				,		+	į	+					*		+			\$3.50	Ea.
10)		99	pc	5				,		,		,				,		'n,						\$2.75	Ea.
10)()	81	JP			ě			+				+		ě	,						*		, . Ca	I Us

P.C. board for 27XX EPROMS. . . \$4.00 Ea.

COLORWARE LIGHT PEN



ONLY \$24.95

WITH SIX FREE PROGRAMS ON CASSETTE!

The Colorware Light Pen plugs directly into your joystick port and comes with six fun & useful programs on cassette. Easy instructions show how to use it with Basic and it's compatible with light pen software such as Computer Island's "Fun Pack." Order yours today. Only \$24.95 complete.

TELEWRITER-64

IFIFURITER-64

This is an actual unretouched poloroid photo of a black and white screen should the \$1,24 character set that is senerated by Teletest-6 character how there is also true lose the second that coverse were case letters that morely exerces that coverse case characters in other Color Computer programs.

Teleuriter-64 is truly the most rowerful and soehisticated mord processor you can buy for your color Community or 1970. If you on a printer or are thinking of setting one you really should not be without this program. Teleuriter can be yeed with any 16% 32% or 64% system and with any

21234567890|**\$Z&*()*=[3; abcdefahijkimnoparstuwxx z,./;()?+!*\$Z&*()*:=-# DISK \$59.95 CASSETTE . . . \$49.95

Colorware researched the word processors available for the Color Computer, This is the best. Telewriter-64 is a truly sophisticated system that is marvelously easy to use. It works with any 16K, 32K or 64K system and any CoCo compatible printer.

TOP-RATED COCO WORD PROCESSOR





TOLL FREE ORDERING 800-221-0916

ORDERS ONLY, N.Y. & INFO CALL (718) 647-2864

Why do more CoCo owners choose 'REAL TALKER'?

Sure it's priced right, but there's more...

Thousands of 'Real Talker' owners know 'Real Talker' beats ALL other Coco voice synthesizers in ease of use and flexibility. And, NO other Coco talker has a clearer, more intelligible voice. That's quite a lot of advantage when you consider Real Talker's unbeatable price. Yet, Real Talker has some important features that you simply will not find in other Coco talkers:

'Real Talker' is compatible with any 16K, 32K, 64K Extended or non-extended Color Computer. It works with any cassette or disk system and comes complete and ready to talk through your T.V. or monitor speaker. Price includes the 'Real Talker' electronic voice synthesizer in a ROM pack, software on cassette (may be transferred to disk), and user manual.

'SAY' command - You'll have your computer talking brilliantly in just minutes thanks to this powerful new command. Type SAY "ANYTHING YOU WANT" and your words are instantly spoken. It's that simple. Think how easy this makes creating speaking Basic programs. Adding speech to your existing programs is a snap too.

'CONVERT' - This is a truly powerful command for the basic programer. CONVERT automatically transforms a machine language dependent speaking program into a stand-alone Basic program. In other words, you can effortlessly write speaking Basic programs that do not require a machine language translator in memory. This is a uni-que feature of 'Real Talker'. No other voice synthesizer gives you anything even remotely approaching this type of capability even synthesizers costing considerably more.



'Real Talker' is a full-featured electronic voice synthesizer unit built into a compact cartridge case. You simply plug it into the side of your computer.

NOW INCLUDED WITH 'REAL TALKER'.....

- 1. 'DR. TALK-This interactive "Eliza" type psychoanalyst program will discuss your innermost problems at length.
- 2. 'TALKING BATTLESHIP'-It's you vs. the computer in this speaking version of the classic game.
- 3. TALKING BLACKJACK'- Play for big stakes against a rather talkative casino dealer.

ONLY **\$5995**

Other features include software controlled pitch, unlimited vocabulary text-to-speech, and even a program that will recite any ASCII file (such as from Telewriter-64 & other word processors). You also get Colorware's unique full-screen phoneme editor program that let's you experiment with and modify speech at it's most fundimental level.

'REAL TALKER-1' (for the original Color Computer)......\$59.95 'REAL TALKER-2' (for the Color Computer-2).....\$64.95

'Y - BRANCHING CABLE' For disk systems. If you have a disk system but do not have a Radio Shack Multi-Slot unit, this economical cable will allow to connect and use your Real Talker and Disk system together......27.95

TALKHEAD

If you have a 'Real Talker', do not deprive yourself of this absolutely incredible machine-language Talking Head simulation program. While other talking head simulations use a minimal cartoon-like face, TALKHEAD uses high resolution, fullscreen, digitized images of an actual person's face to create a life-like animated effect.



SOFTWARE FOR THE 'REAL TALKER'

TALKHEAD can be easily commanded in Basic to appear on screen and say anything you want. Available on cassette or disk for only \$19.95, TALKHEAD requires 64K and a Colorware 'Real

ONLY \$19.95

ACTUAL UNRETOUCHED PHOTO



COLORWARE INC. (718) 647-2864



* * * ORDERING INFORMATION * * * ADD \$2.00 PER ORDER FOR SHIPPING & HANDLING.

C.O.D.'S: ADD \$3.00 EXTRA.
SHIPPING & HANDLING FOR CANADA IS \$4.00 WE ACCEPT VISA, MASTER CARD, M.O.'S, CHECKS. N.Y. RESIDENTS MUST ADD SALES TAX.

2120 YO=YO+1: A\$="YOU TAKE THE B UCKET AND CRAWL BACK UP TO ... ": GOSUB 1530: RETURN 2130 COLOR 3,1: L=1: FOR V=35 TO 59: FOR K=3 TO 1 STEP -2 2140 COLOR K,1: LINE(111+L,V)-(1 37,35), PSET: NEXT K: L=L+1: NEXT V: COLOR 3,1 2150 A\$="OH MY GOODNESS! A TRAPD OOR OPENS AND DROPS YOU THROUGH. ": GOSUB 1530: A\$="BUT DON'T WOR RY TOO MUCH.": GOSUB 1530 2160 CIRCLE(136,96),40,2,1,.77 47: X\$="C2; BM136,96": DRAW X\$+"G 5H5G5H5G5H5G5": DRAW X\$+"H5E5H5E 5H6E6H6R6" 2170 CIRCLE(150,75),10,2,.5: PAI NT(128,133),2,2: CIRCLE(150,75), 2,4,.7 2180 A\$="A RENEGADE FROM SOME GE NTLER VIDEO PASTIME CATCHES YOU BEFORE YOU HIT THE FLOOR.": GOSU B 1530: A\$="IT HAS EATEN RECENTL Y BUT MANAGES TO PAC YOU IN. THE END": GOSUB 1530 2190 GOSUB 1820: GOTO 2190

2200 IF X\$="L" THEN V=2 ELSE V=1

2210 IF X\$="L" THEN A\$="A MUMMY

APPEARS, SAYING . . . ": GOSUB 15

30: A\$="I AM ENRAGED BY THE ORAN

GE OF YOUR FLAGON!": GOSUB 1530

A SKELETON IN THE CLOSET. IT SAY S . . . ": GOSUB 1530: A\$="YOU CA ME HERE TOO SOON, YET YOU ARE NO W... THE LATE.": GOSUB 1530 2230 A\$="YOU TAKE A PERMANENT PL ACE ON THE OTHER SIDE OF THE MID DLE DOOR.": GOSUB 1530 2240 CIRCLE(128,95),38,,2,.5,1: X=107: Y=70: A\$="R I P ": GOSUB 1540 2250 COLOR 2,1: FOR X=90 TO 166: LINE(X, 100)-(X+(3-RND(6)), 100-R ND(15)), PSET: NEXT X: COLOR 3.1: 530: GOTO 2610 R <N>0.": GOSUB 1530 \$<>"N" THEN 2280

2260 A\$="IT LEADS TO A SECLUDED GLEN JUST BEHIND LURKLEY MANOR. YOUR FINAL STOP.": KZ=1: GOSUB 1 2270 A\$="NOIRA DARK ASKS IF YOU HAVE SOMETHING TO DRINK. <Y>ES O 2280 X\$=INKEY\$: IF X\$<>"Y" AND X 2290 IF X\$="N" AND FL\$="" THEN A \$="DON'T FORGET ME.": GOSUB 1530 : RETURN 2300 IF X\$="N" AND FL\$<>"" OR X\$ ="Y" AND FL\$="" THEN A\$="SHE CAL LS YOU A LIAR, AND RIGHTLY SO. S HE FLIES INTO A RAGE.": GOSUB 15 30: GOTO 2370 2310 A\$="SHE ASKS FOR A DRINK: < Y>ES OR <N>O.": GOSUB 1530

2330 IF X\$="Y" AND LEFT\$(FL\$,2)= "BL" THEN AS="IT'S BLUE! I HATE PRUNE JUICE, OR WHATEVER IT IS! : GOSUB 1530: GOTO 2370 2340 IF X\$="Y" AND FL\$="ORANGE" THEN A\$="SHE SNIFFS AT IT, SAYIN G: THE SKELETON MUST OKAY THIS F IRST.": GOSUB 1530: RETURN 2350 IF X\$="Y" AND FL\$="ORANGEX" THEN FL\$="": YO=3: CV=1: A\$="TH AT TASTED VERY GOOD! MY ADVICE T O YOU GO WALK THROUGH A WALL.": GOSUB 1530: RETURN 2360 IF FD=0 AND X\$="N" THEN FD= 1: A\$="SHE VOWS: YOU'LL SLAKE MY THIRST BEFORE YOU ESCAPE! SCRAM !": GOSUB 1530: RETURN ELSE IF X \$="N" THEN A\$="REMEMBER MY VOW." : GOSUB 1530: RETURN 2370 COLOR 2,1: CIRCLE(200,66),1 6,1,1.1,.35,.67 2380 DRAW"BM190,52;L15H9L7F14R15 F2": CIRCLE(163,40),8,,.7: PAINT (163,40),1,2: DRAW"BM163,10;D25"

2390 A\$="SHE PRODUCES A BOMB.":

2400 FOR X=10 TO 35: FOR V=4 TO

1 STEP -1: COLOR V,1: CIRCLE(163

,X),2,V: NEXT V: PLAY "T254;01;C

GOSUB 1530

2320 X\$=INKEY\$: IF X\$<>"Y" AND X

\$<>"N" THEN 2320

2220 IF X\$="R" THEN A\$="THERE'S : NEXT X Training Stran BUSINESS DATABASE SYSTEMS BUSINESS ARPLICATION PACKAGES An economical and powerf can be used indepen ns or with WORKBASE ABASEI for additional updating ile to define (he following and store calculations a report mo apply to each application package. • predefined and store unlimited report format reports • pr · simultaneous headings • a w with totals ar d processor nt or display selected records updating of related 600 records per predefined database built in calculations complete audit hails 40 to 50 page step-by-step see's manual to merge a database with custo letters, rec ts, and mailing bels • utilities database file a meraina s marizing, and indating . only menu driven • isk drive and a equired • 216 Packages currently available. • INVENTORY CONTROL • ACCOUNTS age step-by-step er's manual with RECEIVABLE SALES ORDER ENTRY • CHORCH MEMBERSHIP • ACCOUNTS PAYABLE • PURCHASE ORDERS • RENTAL PROPERTY MANAGEMENT • GENERAL LEDGER • PAYROLL tutorial and separate demonstration disk
WORKBASE DATABASE I – 600 Records \$64.95 WORKBASE DATABASE II - 1200 Records \$79.95 COST PER PACKAGE \$24.95 (\$19.95 when purchasing 2 or more) BUY WORKBASE DATABASE I or II AND GET ONE APPLICATION PACKAGE FOR \$19.96 · SEMO CHECK OR MONEY ORDER OR USE OUR/TOLL FREE NUMBER PRICE INCLUDES SHIPPING & HANDLING WITHIN USA . ADD S5 FOR ALL FOREIGN ORDERS . CASH ONLY COD ORDERS ADD \$2 FOR PLACING CREDIT CARD ORDERS: 1-800-334-0854 (Ext. 887) RESIDENTS ADD 4.5% SALES TAX

DATA SYSTEMS

P.O. Box 3448, Durham, N.C. 27702 (919) 286-3445

2410 COLOR 4,1: FOR X=1 TO 60: F OR V=0 TO 1: SCREEN 1,V: LINE(16 3,40)-(RND(255),RND(134)),PSET: NEXT V,X: COLOR 3,1 2420 A\$="NO ONE SURVIVES. WILL T HIS TEACH YOU NOT TO FIB?": KZ=1 : GOSUB 1530: PLAY "T1" 2430 GOSUB 1820: GOTO 2430 2440 A\$="BLURTON SAYS: I SEE YOU HAVE A FLAGON. MAY I HAVE A SIP - <Y>ES OR N<O>?": GOSUB 1530 2450 X\$=INKEY\$: IF X\$<>"N" AND X \$<>"Y" THEN 2450 ELSE IF X\$="Y" AND FLS="BLUE" THEN AS="SEE MY M OMMY - I MEAN MY MUMMY - TO GET THIS APPROVED BEFORE I DRINK IT. ": GOSUB 1530: RETURN 2460 IF X\$="Y" AND LEFT\$(FL\$,2)= "OR" THEN AS="IT'S ORANGE STUFF, WHICH I HATE!": GOSUB 1530: A\$= "HE FIRES. YOU FALL. IT ENDS.": GOSUB 1530: GOTO 2610 2470 IF X\$="N" THEN A\$="BLURTON SCOWLS: NO ONE REFUSES ME. I'M A BLUEBLOOD!": GOSUB 1530: A\$="HE AIMS THE PISTOL AT YOU AND FIRE S! THE END.": GOSUB 1530: GOSUB 2490: GOTO 2610 2480 A\$="BLURTON DRAINS THE FLAG ON AND KEEPS IT.": GOSUB 1530: A \$="HE SAYS: I LIKE IT. I PROMISE NEVER TO SHOOT YOU.": GOSUB 153 PPY": GOSUB 1530: GOTO 2580 0: FL\$="": PI\$="EMPTY": RETURN 2590 GOSUB 2600: GOSUB 2650: GOS

2490 FOR V=1 TO 10: CIRCLE(159.4 5),3,4: POKE 65494,0: PLAY"T32;0 5;CB" 2500 CIRCLE(159,45),3,1: CIRCLE(8+RND(20),60+RND(20)),3,4: NEXT: POKE 65495,0: RETURN 2510 LINE(40,40)-(215,95), PSET, B : LINE(40,40)-(0,0), PSET: LINE(2 15,40)-(255,0), PSET: LINE(215,95)-(255,135), PSET: LINE(40,95)-(0 ,135), PSET: RETURN 2520 DRAW"BM225,105;U50E20D90": PAINT(228,101),2,3: RETURN 2530 DRAW"BM30,105;U50H20D90": P AINT(27,100),2,3: RETURN 2540 LINE(DS,50)-(DS+30,95), PSET B: PAINT(DS+2,52),2,3: RETURN 2550 GOSUB 2650: CIRCLE(200,80), 12,4: PAINT(200,80),4,4: LINE(1, 120)-(1,120), PSET: FOR V=1 TO 25 5 STEP RND(15)+10: N=N+1 2560 N=N+1: IF N/2=INT(N/2) THEN V1=80+RND(20) ELSE V1=100+ RND(20) 2570 LINE-(V,V1), PSET: NEXT: LIN E-(254,120), PSET: PAINT(2,134),3 ,3: DRAW"C2;Bf140,100;U30R10D10R3 OUIOR10D30L50": PAINT(43,98),2,2 2580 A\$="IT IS DAWN AS YOU ESCAP E LURKLEY MANOR. YOU ARE VERY HA

UB 1600: A\$="IT'S IGOR! HARUMPH! NEVER HOPED -- I MEAN EXPECTED T O SEE YOU AGAIN.": GOSUB 1530: A \$="I GIVE YOU A PARACHUTE. USE I T WELL. I NOW RETURN YOU TO THE GREAT HALL.": GOSUB 1530: GOTO 1 2600 AS="UP THE CHIMNEY YOU FIND THE ATTIC. SOME WEIRDNESS HAPPE NS - A COLOR FIELD...": GOSUB 15 30: FOR V=1 TO 20: PCLS RND(3)+1 : SCREEN RND(2),1: NEXT: GOSUB 2 650: RETURN 2610 PLAY "T1": GOSUB 1820: GOTO 2610 2620 LINE(S1,P1)-(S2,P2), PRESET, BF: RETURN 2630 IF KZ=1 THEN KZ=0: RETURN E LSE FOR T=1 TO 500: NEXT: COLOR 1,1: LINE(0,140)-(255,Y+12), PRES ET, BF 2640 X=1: Y=140: COLOR 3,1: RETU RN 2650 PMODE 3,1: COLOR 3,0: PCLS1

: SCREEN 1,1: LINE(0,0)-(255,135), PSET, B: RETURN 2660 X\$=INKEY\$: HY=INSTR(DI\$,X\$) : IF X\$="" OR HY=0 THEN 2660 ELS E RETURN

2670 FOR V=1 TO 15: CIRCLE(22,60), V, RND(2)+2,1.8: NEXT V: RETURN

1

2680 REM - END OF LISTING

TOLL FREE 1-800-338-6800 For Ordering

DATA-COMP

CoCo Disk Drive Systems

NEW LOWER PRICES

These PAKS INCLUDE DRIVE, *CONTROLLER, POWER SUPPLY & CABINET, CABLE, And MANUAL * Specify What CONTROLLER You Want J&M, or RADIO SHACK

PAK #1 - 1 Single Sided, Double Density SYS. \$389.95 PAK #2 - 2 Single Sided, Double Density SYS. \$639.95 \$439.95 PAK #3 - 1 Double Sided, Double Density SYS. PAK #4 - 2 Double Sided, Double Density SYS. \$699.95 PAK 45 - 2 Double Sided, Double Density SYS. Thinline Drives, Half Width \$499.95

Controllers

J&M Disk CONTROLLER w/ JDOS or RADIO SHACK Disk BASIC, Specify What Disk BASIC.

RADIO SHACK Disk CONTROLLER 1.1

Disk Drive Cables

Cable for One Drive Cable for Two Drives

64K UPGRADE w/MOD. Instructions, C,D,E,F, and COCO II HJL Keyboards

MICRO TECH Lower Case ROM Adapter

RADIO SHACK BASIC 1.2 RADIO SHACK DISK BASIC 1.1 RADIO SHACK EXT. BASIC

DISK DRIVE CABINET & POWER SUPPLY

SCREEN CLEAN Clears Up Video Distortion

Single Sided, Double Density 5" Disk Drive Double Sided, Double Density 5" Disk Drive

Verbatim Diskettes

Single Sided Double Density Double Sided Double Density

\$ 24.00 \$ 24.00 New Lower Prices - EPSON PRINTERS - RIBBONS - SERIAL BOARDS

\$ 44.95

\$ 69.95

\$ 74.95

\$ 29.95

\$ 29.95

\$ 39.95

\$ 39.95

\$ 49.95

\$199.95

\$249.95

DATA-COMP

5900 Cassandra Smith Rd. Hixson, TN 37343



VISA

\$139.95

\$134.95

\$ 19.95

\$ 24.95

SHIPPING

Add 2 % USA ADD 5% Foreign

TOLL FREE 1-800-338-6800 For Ordering

TELEX 558 414 PVT BTH

Constructing 16K Of EPROM For Your Disk Controller

By Tony DiStefano Rainbow Contributing Editor

lot of people call or write to me with suggestions about doing this and trying that, and I plan to start doing some of them soon. Some of the most popular ones are quite good, but I'll not mention them right now. I wouldn't want to say something and not live up to it later.

I would like to apologize to my readers for the errors that sometimes appear in "Turn Of The Screw." You see, all of the projects that appear in this article, I have built, tested and debugged. The biggest problem is when it is time to write the article, I have to take my prototype and transfer all the hardware information into type. That means diagrams, parts lists, text and schematics. This is where I am most vulnerable to errors. Once I have finished the rough draft, I read it over again, then when all is completed, I read the whole thing once more. Errors, however, do creep in; please bear with me, I do my best.

If, when constructing one of my

(Tony DiStefano is well-known as an early specialist in computer hardware projects. He lives in Laval Ouest, Quebec.)

projects, you do come across something that does not seem right, don't continue. Stop and study the situation. If you don't come to a solution, contact me either by letter (include a SASE) to THE RAINBOW, or by calling me on any Monday night at (514) 473-4910. Never try to do something unless you are sure of what you are doing. Be forewarned, the computer is not very forgiving. One error can cause a lot of damage. I know, I have burnt out a few chips in my time and occasionally still do.

Now to get to this month's topic. One of the memory mapped areas I described in last month's article is the area reserved for the cartridge ROM pack. I also said that when you plugged in the disk controller, the Disk Operating System (Disk BASIC) used this area. This month, we will look into expanding Disk BASIC hardware.

To recap this area, the *CTS pin on the controller controls the ROM chip that contains the disk software. The *CTS select line can access a total of 16,128 bytes. (Better known as 16K.) It is memory mapped from 49,152 (\$C000) to 65,279 (\$FEFF).

The ROM that Radio Shack uses in Disk BASIC is only 8K long, the lower

8K, from 49,152 (\$C000) to 57,343 (\$DFFF). All references to the "lower 8K" will be at this address. That leaves the upper 8K, from 57,344 (\$E000) to 65,279 (\$FEFF), of unused memory. All references to the "upper 8K" will be this area.

Actually, this memory is not unused. It is memory mirrored to the lower 8K. This means it is not properly decoded and when the upper 8K accesses, the lower 8K chip responds. For example, type in:

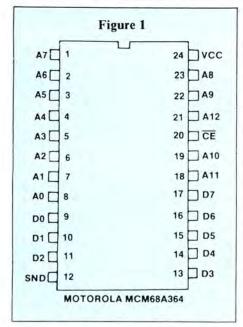
PRINT PEEK (49152) ENTER

and

PRINT PEEK (57344) ENTER

Both responses will be the same. Now, if we were able to properly decode this area, we could use the free space to add another chip, usually an EPROM. This chip could be used as an extension of Disk BASIC or oftenused utilities.

For example, the Spectrum DOS, by Spectrum Projects, could be burned into EPROMs, and whenever you turned the computer on, it would be



right there. (I will not go into how to work with or use EPROM programmers. There are several on the market and all seem to be good; it all depends on price and ease of use. Usually the more you pay, the easier it is to use. I will leave the software programming up to you.)

What I intend to do in this article is describe the chip that is in the Radio Shack controller when you buy it, and the way you can interface two 8K EPROMs or one 16K EPROM.

The 8K EPROM I will use is the Intel 2764; it is the most economical one I have found. The 16K EPROM is the Intel 27128 (a little more expensive, but a little less trouble). Other manufacturers make the same chip, but make sure it is the Intel pinout as opposed to the TI pinout. You can use the TI pinout chip, but you'll have to figure out the pinout changes for yourself. Another note: If you like to use the high speed poke, for POKE 65495,0 you must use a 300 ns. access time chip, or faster, in order for it to work. The slower 450 ns. chip works in the regular mode, but not at the faster rate.

Now, the chip that contains the Disk BASIC software is made by Motorola. This chip is a masked ROM — ROM means Read Only Memory. That means the data contained in this chip can never be changed, erased or lost (unless you burn out the chip). The data is permanently printed directly on the chip itself at the time of production. It costs less to produce a ROM as long as the quantity is high.

The chip used here is an

MCM68A364. It is an 8K by 8 ROM. Figure 1 shows the pinout of this chip. By the way, the BASIC and Extended BASIC chips are also the same chip, just different masks.

The first way of using all of the 16K memory in the cartridge area is to use a 16K EPROM. Figure 2 shows the pinout of an Intel 27128 EPROM. Examine the diagram and compare it to Figure 1.

What is wrong with this picture? There are 28 pins on this chip. The 8K ROM has only 24. This is a bit of a problem, but certainly not unsurmountable. It's time to get the ol' soldering iron and wire out. The following is a step-by-step procedure to modify and solder up a 27128 EPROM to fit (kind of) into a 24 pin socket. I recommend only those experienced in soldering attempt this.

The first thing we must do is study the pinout for this chip. Examine Figure 2, the Intel 27128 chip. The first thing we notice is that it has 28 pins, four more than the socket. Pin numbers 1, 2, 27 and 28 are the odd ones. If you line up pin #3 of the EPROM and pin #1 of the ROM, the rest of the pins are almost the same as the ROM. The different pins between an Intel 27128 and an MCM68A364 are as follows:

Pin#	EPROM	ROM
1 (-)	Vpp	N/C
2 (-)	A12	N/C
20 (18)	CE	A11
22 (20)	OE	CE
23 (21)	A11	A12
26 (24)	A13	Vcc
27 (-)	PGM	N/C
28 (-)	Vcc	N/C

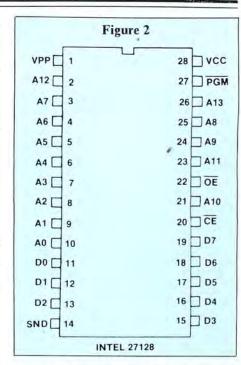
When it is time to insert this chip into the 24 pin socket, let the odd pins hang out. Pin #3 on the IC will plug into pin #1 on the socket. Make sure you get pin #1 right. It is usually marked with a small hole or a notch.

Step 1 — Bend pins #20, #23 and #26 (on the IC) out far enough so when you insert the chip these pins will not enter the socket. Make sure it does not touch anything.

Step 2 — Solder a short piece of #30 wire from pin #20 to pin #22 on the IC.

Step 3 — Solder another piece of #30 wire from pin #1 to pin #28 and pin #27 on the IC.

Step 4 — Solder one end of a oneinch piece of #22 wire to pin #28 on



the IC. Strip 1/8 inch of insulation from the other end. This end will insert into the empty pin #24 of the socket.

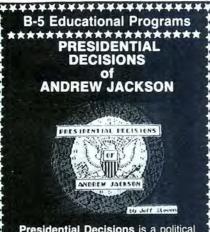
Step 5 — Solder one end of a twoinch piece of #22 wire to pin #2 on the IC. Strip 1/8 inch of insulation from the other end. This end will insert into the empty pin #21 of the socket.

Step 6 — Solder one end of a oneinch piece of #22 wire to pin #23 of the IC. Strip 1/8 inch of insulation from the other end. This end will insert into the empty pin #18 of the socket.

Step 7 — Solder one end of a fourinch piece of #30 wire to pin #26 on the IC. Solder the other end of this wire to pin #37 on the edge connector, the side that plugs into the computer. That is the second to last pin closest to you on top, on the right-hand side if you are looking at the front of the controller.

That's it! Carefully insert the chip into the socket making sure there are no shorts. You now have a 16K EPROM in your controller. If you want to erase this EPROM, just remove all of the solder spots and start over again. If you do a good job in soldering and de-soldering, the EPROM could stand about 10 or so recyclings.

If you don't want to use a 16K EPROM, or your present programmer cannot handle 16K chips, then using two 8K EPROMs is the answer. There are two problems with using two 8K EPROMs. The first problem is how to decode the two separate chip select lines and the last address line. Figure 3 shows the pinout of an Intel 2764.



Presidential Decisions is a political simulation. You are presented with ten issues that President Jackson had to face, and the object is to make the same decisions that the President made. To help you with your decisions, you may read period newspaper accounts, ask advice of Jackson's contemporaries, or reflect on the past experiences of Jackson. Presidential Decisions is an exercise in critical thinking that is packed with interesting historical data. When you complete this simulation, you feel as though you know Andrew Jackson. Students and history buffs will love it!

CoCo - 32K ECB Disk - \$31.95

MUSIC THEORY

Music Theory is a complete computer assisted instruction program that teaches the construction of scales and chords, and ear training. It is written by Albert G. Huetteman, Associate Professor of Music at the University of Massachusetts, and includes sequential lessons on: Major scales, Harmonic Minor Scales, Interval Spelling, Triads (chords), Inversions, Dominant 7th Chords, and Intervals (Ear Training). Each lesson features background information, drill and practice routines, and scoring. Music Theory is a well organized, in depth tutorial. Excellent visual and auditory screens make this program wonderful for any theory level, beginning through college!

CoCo - 32K ECB Disk - \$49.95

★ Other popular B-5 Programs for Grades K - 12

ABC's ● Spelling ● Clock
Hangword/Scramble ● Keyboard
Borrow ● Carry ● Mathfacts
Money ● Skip Counting ● Congress
Questions ● Basketball Statistics

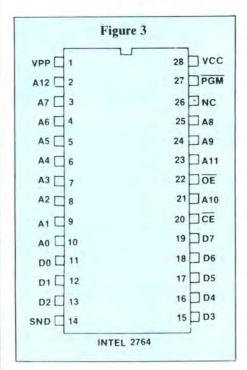
In addition to our programs, we carry a full line of software from other publishers. Let us meet all your educational needs. Programs available for Color Computer, TI 994/A, Commodore 64 and Apple. Selected B-5 software titles available through Radio Shack's Educational Express Order Service.

Write for a free brochure or ask your dealer for a demonstration.



B-5 Software Co. 1024 Bainbridge Place Columbus, Ohio 43228 Phone (614) 276-2752 Notice that pin #27 is the pin used in the programming of this chip. However, if this pin is low during a read cycle, the chip "deselects" — the chip does not respond to a read. It stays deselect all the time this pin is low. If we were to attach the last address line to it (A13) when this line was low, the chip would not activate. The fact that A13 is low means you are accessing the lower 8K block. Since the chip deactivates when it is low, it meets the decoding needs of the upper block.

On the other hand, pin #20 of the



is made to activate the chip when low. So, if we tied A13 to this line, the chip would behave opposite to the first. It would be deactivated when A13 is high. This would properly decode for the lower 8K block and deactivate for the upper.

Using this technique would solve our first problem, but we still have one more problem: Where to put the second chip? I have used this technique before and most likely I'll use it again — it's great. It is called the "piggyback" technique. We will solder the two chips on top of each other, except A13 and a few more, to get it to fit in a 24 pin socket.

Before we go any further here, there is a difference between an Intel 2764 and an Intel 27128: The 2764 has an N/C on pin #26, whereas the 27128 has A13.

The following is a step-by-step instruction on how to solder up two

2764s to fit in a 24 pin socket and be accessed as a 16K chip.

Step 1 — Program the first chip with the data that goes into the lower 8K and mark it as the lower chip. Program the second with the data that goes into the upper 8K and mark that one as the upper chip. It is important not to get the two mixed up, they are not wired up the same way.

Step 2 — Take the lower chip and bend pins #20 and #23. Take the upper chip and bend pins #20 and #27.

Step 3 — Mount the upper chip on top of the lower chip so pin #1 is on pin #1, 2 on 2, and so forth, leaving a small gap for air circulation. Solder all the unbent tips of the upper chip to the bases of the lower chip. Even if the lower pin is bent, in the case of pin #23.

Step 4 — Solder a one-inch piece of #30 wire from pin #20 to pin #22 on the upper IC.

Step 5 — Solder another piece of #30 wire from pin #1 of the lower IC to pin #28, #27 and #26 of the lower IC.

Step 6 — Solder one end of a twoinch piece of #22 wire to pin #2 on the upper IC. Strip ½ inch of insulation from the other end. This end will insert into the empty pin #21 of the socket.

Step 7 — Solder one end of a twoinch piece of #22 wire to pin #23 on the upper IC. Strip 1/8 inch of insulation from the other end. This end will insert into the empty pin #18 of the socket.

Step 8 — Solder yet another twoinch piece of #30 wire from pin #20 of the lower IC to pin #27 of the upper IC. Solder one end of another four-inch piece of wire to pin #27 of the upper IC and solder the other end of that to pin #37 of the edge connector. See the first Step 7 for proper location of this pin.

You are now ready to plug the "spider" (as I call it) into the socket. Remember pin #3 in the spider goes into pin #1 of the socket. The other four pins sticking out over the socket are #1, #2, #27 and #28.

By popular request, for those of you who do not want to build this project, there is a board adapter available, built and tested, that you can buy from R.G.S. Micro which does the same thing. See their ad in this magazine. It fits inside only the J&M controller and is made for two Intel 2764 EPROMs.

That is it for now, enjoy your 16K Disk BASIC.



Part One of a two-part series

CoCo Becomes

If you own a small business and have any employees, then you know what a hassle payday can be. Now you can put your CoCo to work doing your payroll and allow yourself more time for important matters.

Here's a payroll package that's patterned after one used by a large American corporation. But this one only requires a 16K CoCo, a disk drive and a printer.

Payroll Package is a sophisticated set

(Dennis Weide is a communications technician for AT&T Communications where he is assigned to the electronic switching system. His hobbies include designing and making toys and computers.)

Table 1 Payroll System Program Description (As listed on Disk Directory)

COMPUTE/BAS — Computes payroll for all employees. Calculates net and gross pay. Keeps track of employee

attendance. Generates all data for all databases.

EMPLOYEE/BAS — Prints pay checks, pay stubs and employee

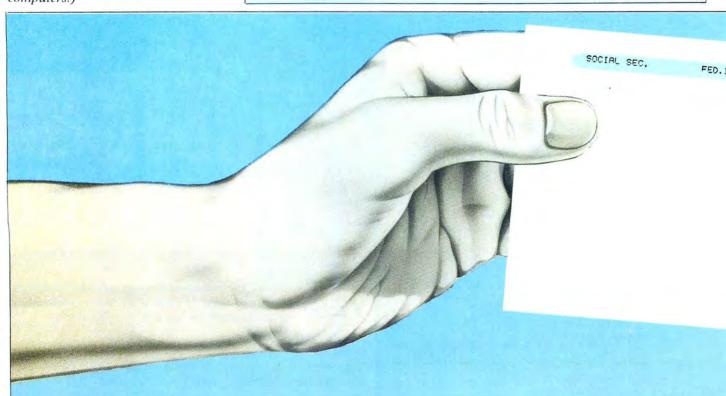
mailing list.

EMPLOYER/BAS — Database manager for payroll database.

Allows editing of the database.

PAYROLL/DAT — Database for all employee data. Used to compute pay and print paychecks.

EMPLOYER/DAT — Database for all employer records. Used to compute payroll for employer





The Paymaster

By Dennis H. Weide

of four programs that should make your business life easier. It shows the usefulness of the CoCo in small business applications. These four programs will compute the payroll, write the paychecks, and keep employee and employer payroll records as well as attendance and vacation records.

It can be modified to analyze or print the stored data in any format desired. You can modify it to print the W-2 forms Uncle Sam requires from everyone. Table 1 gives a brief description of each program and its function.

The programs are straightforward with no fancy gimmicks (PEEKs and POKEs), so they will work on any version of the CoCo with 16K or more and Disk BASIC. The variables are listed along

with an explanation at the beginning of each program so any experienced programmer can easily modify them.

How it Works

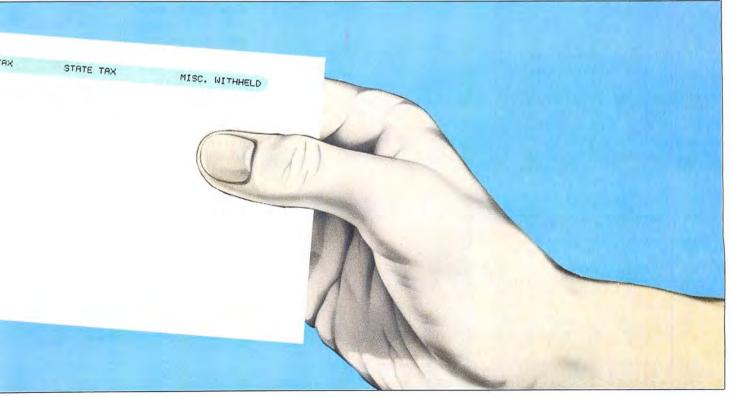
On a normal weekly, bi-weekly or monthly schedule, load and run the payroll program. Enter the payroll codes for each employee, then ask for the paychecks to be printed and sit back and relax or go play a fast round of golf.

A hard copy of the employee's payroll data is provided for the employee and employer to sign and save for reference. After the payroll data has been entered for all employees, you can command the program to print the paychecks and pay stubs.

Setting up the System

This month we'll see how to build and manage the data files used in the package. To get started, key in program listings 1 and 2 one at a time. It's not necessary to key in any lines using REMarks, however, it will make it easier to modify the programs later.

After you have keyed in each program, save it to disk using the program name listed in Line 1,000 of that program. You can save a lot of time if you notice that some subroutines and remarks are common to several programs. Save them to disk using the ASCII option and merge them with each program as needed. Since you'll be reading and writing to disk, it's a good idea to make a backup copy of



the finished programs before running them.

Employee Data File Manager

Now let's take a look at the data files and the programs that manage them. The employee data file consists of a program and file for storing all employee payroll information. Each employee is assigned a record number in the file. A built-in editor allows you to correct errors and retrieve, print, delete or move a file.

Finding a Record Number

To use the editor routine, you must know the employee's record number. This number represents the order the record is stored on disk. To find the record number, enter '6' from the main menu of the *EMPLOYEE* program (LIST RECORDS). The program will read all records on the disk and print each record number and employee name on the screen

Editing an Employee Record

To edit an employee record, enter '4' from the main menu and follow the prompts. To make corrections, enter the new data at the appropriate prompt

then press ENTER. If no correction is required for a prompt, press ENTER and the program will jump to the next prompt without changing the data.

Prompts showing commas require more than one entry. If all data should remain unchanged, press ENTER until the next prompt appears. If one entry of a multiple input entry is changed, you must make an entry for each input. Always verify data when finished by requesting a printout of the edited employee's file.

Printing a Record

To print an employee's record on paper, enter '3' from the main menu. You'll be prompted for the employee's record number. If you enter ALL, the program will print a record for every employee on file. If you enter NONE, the program will return to the main menu.

Entering any number from one to 10 will print the record for that employee. A sample employee printout is included (Figure 1). It is self-explanatory, so when you practice using the package, you shouldn't have any trouble understanding it.

Figure 1 SAMPLE EMPLOYEE PRINTOUT DISK FILE RECORD # EMPLOYEE NAME AND ADDRESS NHOL 123 ANYPLACE ST. ALBUQUERQUE , NM 87123 EMPLOYEE STATUS DEPENDANTS HOURLY WAGE COMMISSION SOCIAL SEC. # 10.5 % 001010001 \$8.50 UNION DUES SAVINGS PLAN GROUP INSUR. CONTRIBUTIONS \$9.00 \$20.00 \$1.50 \$5.00 WITHHOLDING THIS PAY PERIOD MISC. WITHHELD SOCIAL SEC. FED. INC. TAX STATE TAX \$0.00 \$0.00 \$0.00 \$0.00 YEAR-TO-DATE WITHHOLDING FED. INC. TAX CONTRIBUTIONS SOCIAL SEC. STATE TAX \$47.84 \$7.14 \$10.00 \$71.40 SAVINGS PLAN UNION DUES GROUP INSUR. GROSS EARNINGS \$9.00 \$3.00 \$49,00 \$714.00 EMPLOYEE ATTENDANCE ABSENCE ALLOWED PAID ABSENCE UNPAID ABSENCE .5 DAYS 30 DAYS VACATION ALLOWED VACATION USED 30 DAYS 3 DAYS JAN 1 PAYCHECK FOR WEEK ENDING 1984 NO PRYCHECK THIS PERIOD

Moving and Deleting a Record

When an employee leaves or retires from the company, you may want to remove that record from disk. Use the edit function of the *EMPLOYEE* program to change the employee's name to NO NAME. The program will now disregard the entire record.

If you wish to overwrite that record, select '5' from the program menu (MOVE EMPLOYEE RECORD). The program will prompt you to verify that the overwrite is correct. The program will only overwrite a NO NAME record. This prevents accidentally overwriting the wrong one and destroying valuable data. If you change a record to NO NAME by mistake, change it back to the correct name by editing it again.

The Employer Data File

The employer data file program stores all the pay period, monthly and year-to-date (y-to-d) totals for the employer's records. It can print, edit or create files much the same as the employee data record program. Prompts and inputs are similar to the employee program so I won't go into much explanation.

You should note that making any changes in the employee data file will most likely require a change in the employer data file, also. Again, a sample employer printout (Figure 2) is shown here and is self-explanatory.

Using the Package

To use these programs, first build the employee and employer data files. Start by typing RUN 'EMPLOYEE' and enter. The *EMPLOYEE* program will load from disk and a menu will be displayed on the screen.

Enter '2' to reserve disk space for your employee file. You'll reserve 10 separate records in the employee file, each labeled NO NAME. A warning will appear on the screen telling you you're about to erase all data. This is to prevent accidental erasure of the data file. Since there is no data file yet, enter 'R' to reserve space.

Enter'l' from the main menu to input employee data into the data file. You'll be prompted for the field entries. The

	ble 2	Ta	
Of Employees	olling Numbe	Lines Contro	
R COMPUTE	EE CKWRIT	EMPLOYE	PROCRAM>
19400	11200	12300	
	13000	15800	
		17400	
		32200	

prompts are self-explanatory, but note that any displaying commas must have commas separating the entries as shown. After all entries have been made, you'll be asked if they are correct. Enter 'Y' to save all information to disk. Enter 'N' to erase the entries from RAM and start over.

If you don't wish to create an employee record, you can enter NO NAME for the name prompt and ENTER for all others until you return to the main menu.

Errors can be corrected using the employee data file editor. After each record is created, you'll be asked if you want to create another. Enter 'Y' for yes or 'N' to return to the main menu.

While this program only handles 10 employees as written, you can increase its capacity to over 500 employees by changing the proper loop values in the programs. Table 2 shows the program names and lines to change to increase or decrease the number of employees.

After building your employee data file, you can get a hard copy of all the data by entering '3' from the main menu and answering the prompt with ALL. All employee data will be output to the printer, allowing you to verify each employee record in the file. Use the editor function to correct any errors.

When your employee data file has been confirmed correct, enter '8' to load and run the *EMPLOYER* program. This program records all pay period and y-to-d information for the employer in the employer data file.

	Figu	re 2	
SAMPLE E	MPLOYER PRI	нтоит	
EMPLOYER	RECORD FOR	JANUARY	
MONTHLY	TOTALS		
PAYROLL TOTAL \$5739.70	\$384.56	FED.INC.TAX \$573.97	STATE TAX TOTAL \$57.39
YEAR-TO-	DATE TOTALS		
PAYROLL TOTAL \$5739.70	\$90.9EC.TOTAL \$384.56	FED.INC.TAX \$573.97	CONTRIBUTIONS \$38.00
STATE TAX TOTAL \$57.39	THSURANCE TOTAL \$16.50		
PAY PERI	DD TOTAL		
UNION DUES	CONTRIBUTIONS \$7.00	INSURANCE TOTAL \$3.00	

When the menu is displayed, enter '1' to reserve file space on disk. Again, you will be warned about erasing valuable data, but at this point, there is no employer data, so enter 'R' to create the file on disk. There are no other entries required for the employer data file. The information stored in this file is computed by the COMPUTE program.

All employee data is stored in the EMPLOYEE/DAT file while employer data is stored in the EMPLOYER/DAT file. You can locate these files on disk using the directory DIR command. I used direct access files to save as much disk space and time as possible.

Some Final Notes

Next month, we'll take a look at the programs which actually compute the payroll and print the paychecks. In the meantime, it would be a good idea to practice using the two data file managers we have just discussed. Try creating an employee data file and editing and deleting records from it.

For anyone not wishing to key in the programs, I'll tell you how to get copies next month. If you have any questions or comments, you can write to me at 14201 Marquette N.E., Albuquerque, NM 87123. Please include a SASE. If you have a major program bug, be sure to send along a program listing and sample printouts.

		2200 '	BUFFER	#1-EMPLOYEE	VA
,	2900 49	RIABLES 2300 '			
	670091 24100190 8400120 2540057	2400 '(A\$) ST NAME	12	LN\$=EMPLOYEE	LA
	1000030 2710041 12000213 28400147 14000191 30000199	2500 (B\$) VEN NAME	8	GN\$=EMPLOYEE	GI
Listing 1:	16700 59 31800 146 18500 91 END 146	2600 '(C\$) DDLE INITIA		MI\$=EMPLOYEE	MI
Employee		2700 '(D\$)	20	AD\$=EMPLOYEE	ST
000	EMPLOYEE	REET ADDRES	S		
100 '	EMPLOYEE DATA BASE	2800 '(E\$)	12	AC\$=EMPLOYEE	CI
200 '	FOR PAYROLL PACKAGE	TY			
1300 '	BY DENNIS H. WEIDE	2900 '(F\$)	2	SA\$=EMPLOYEE	ST
1400	(C) 1983	ATE			
1500	44.4	3000 '(G\$)	5	ZC\$=EMPLOYEE	ZI
	:CLEAR1000:F1\$="\$\$#####.	P CODE			
##	":POKE153,20	3100 '(H\$)	9	SS\$=SOCIAL SE	ECU
1700		RITY NUMBER	3		
1800	VARIABLE TABLE	3200 '(I\$)	1	DN\$=NUMBER OF	D
1900 '	USE REM STATEMENTS	EPENDANTS			
2000 '	Asset March (83.15.15.14.14.14.14.1	3300 '(J\$)	5	HW =HOURLY WA	AGE
2100 '		3400 '(K\$)	5	UD =UNION DUE	ES



and showed you our best deals on computer hardware.

HARDWARE SPECIALS

Extended Basic w/bk	\$ 39.95	26-1276 DMP-105 Printer 80 cps	\$179.95
64k (DEI) Memory Upg	\$ 59.95	C. Itoh 8510 AP Printer 120 cps	\$399.95
26-3129CoCo Drive	\$309.00	NAP Video Monitor (Grn	
26-1161 CoCo Drive 1	\$229.00	Amber)	\$109.95
HJL Keyboard (D,E,F,2)	\$ 79.95	Video Monitor Adapters	\$ 29.95
26-3127 64K Extended CoCo2	\$179.95	26-3124 Multi-Pac Interface	\$ 89.95
26-3134 16K Standard CoCo2	\$ 89.95	Botek Ser/Par Interface	\$ 69.95
26-3136 16K Extended CoCo2	\$129.95	DWP 210 Printer	\$379.00
26-3801 Model 100 8K	\$349.95		

ACCESSORIES

26-3816P 8K Upgrade Model 100 \$ 69.95

Volksmodem 1200	\$299.00	Mach II Joystick	\$ 39.95
RS D.C. Modem IB	\$ 89.95	26-3030 OS-9 (64k)	\$ 64.95 (disk)
Novation J-Cat Modem	\$129.95	Basic-09 (req. 0S-9)	\$ 87.95 (disk)
RS D.C. Modem II	\$179.95	"C" Compiler (OS-9)	\$ 87.95 (disk)
USR Password 300	\$179.95	FHL O-Pak (req. OS-9)	\$ 34.95 (disk)
Hayes SM 300 Modem	\$239.95	Elite Word	\$69.95 (d&c)
USR Password 1200	\$429.00	Elite Calc	\$69.95 (d&c)
CoCo Switcher	\$ 39.95	Color Term Plus	\$29.95 (cass)
Elephant Disks ssdd	\$ 22.95	Deft Pascal	\$ 79.95
		26-3012 Deluxe Joystick	\$ 34.95
NEW! Dual Double Sided Driv	es including	NEW! 26-3128 64K	
case, power supply & cable	\$475.00	Direct Video CoCo2	\$219.95

MSI SOFTWARE

MSI DISKUTIL	NEW	\$ 19.95	MSI NAMEFILE		\$ 24.95
COLOR FINANCE 1		\$ 49.95	MSI CALENDAR	NEW	\$ 19.95
COLOR FINANCE II	NEW	\$ 69.95	MSI COLOR PAYROLL	NEW	\$ 99.95

Call for prices and availability of your favorite software and hardware. All advertised items subject to availability. Prices do not include shipping and handling. All of the above units are covered by our 120 day carry-in warranty.

TRS-80 Trademark Tandy Corporation. Prices subject to change without notice.

Write for our FREE newsletter.



DELKER ELECTRONICS, INC.

P.O. Box 897 408C Nissan Blvd. Smyrna, TN 37167



Call Toll Free: 800-251-5008

800-545-2502 (TENNESSEE) 615-459-2636 (TENNESSEE) 615 -254-0088 (NASHVILLE)



3500 '(L\$)	5	CM =CC	DMMISSI	ON
3600 '(M\$)	5	SP =SA	AVINGS	PLA
N 37000 (/N#)	5	CI -C	מעום דו	JC LD
3700 ′(N\$) ANCE	J	GI =G	ROUP IN	NOUR
	5	CC =CH	HARITY	CON
TRIBUTION				
3900 '(P\$)		PC\$=PA	AYCHECH	< TH
IS PERIOD (Y				
4000 '(Q\$)			ISC. W	
OLDING (SAVINETC.)	, CUP	ו אחדאר	JUES, I	VS.,
4100 (R\$)	5	TS =TO	TAL SA	ZI ES
4200 '(S\$)			OCIAL S	
RITY WITHHELI			202112	
4300 '(T\$)	5	FW =FE	EDERAL	INC
OME TAX WITH	HELD			
4400 '(U\$)	5	LW =S	TATE IN	ICOM
E TAX WITHHEL				
4500 '(V\$) RITY Y-TO-D	5	SY =SC	OCIAL S	BECU
4600 '(W\$)	5	EV -E	ED. INC	OME
TAX Y-TO-D	3		- 114C	שויוטי
4700 '(X\$)	5	LY =S	TATE IN	NCOM
E TAX Y-TO-D				
4800 '(Y\$)	5	CY =CH	HARITY	Y-T
O-D				
4900 '(Z\$)	5	UY =UI	ום אסוא	JES
Y-TO-D 5000 (A1\$)	5	CV -C	DOUD 11	
Y-TO-D	J	UY -01	ROUP II	ND.
5100 (A2\$)	5	ST =S	AVINGS	PLA
N TOTAL	_			
5200 (A3\$)	5	PA =TO	DTAL PA	QI6
ABSENT DAYS				
5300 '(A4\$)			OTAL PA	DIF
VACATON DAYS 5400 ′(A5\$)			7TAL 111	IDA T
D ABSENT DAYS		UH = II	OTAL UI	NHAT
5500 '(A6\$)	5	VA =T	TAL VA	ТАП
ION DAYS ALLO		***	J. 1 1 1 1 1	
5600 '(A7\$)	5	AA =PA	AID ABS	SENT
DAYS ALLOWER)			
5700 '(AB\$)	5	RH =RE	EGULAR	HOU
RS				_
5800 (A9\$) URS WORKED	5	OH =01	VERTIME	HO.
5900 (B2\$)	1 1	ME 4=ME	EN ENI	TNE
STRING		AAT 4 AAT	TELY FIAT	71140
6000 '(B3\$)	5	GE =GF	ROSS EA	ARNI
NGS (Y-TO-D)				
	ONTR	OL CODE	ES	
6200 / E#=CUD	-/	\ - \ F0 + \ 1	DUD+ :-	
6300 LF\$=CHR: P\$=CHR\$(30):				
6400 '	1 4,	7 1 1 / T 1 / G :	# 10Z g "3	m)

6500 ' PROGRAM MENU 6600 6700 CLS:PRINTFP\$::PRINTTAB(3) "E MPLOYEE DATA BASE PROGRAM":PRINT 6800 PRINTTAB(10) "PROGRAM MENU" 6900 PRINTTAB(2)"1. CREATE NEW E MPLOYEE FILE" 7000 PRINTTAB(2)"2. RESERVE DISK FILE SPACE" 7100 PRINTTAB(2)"3. EMPLOYEE PRI NTOUT" 7200 PRINTTAB(2)"4. EDIT EMPLOYE E FILE" 7300 PRINTTAB(2)"5. MOVE EMPLOYE E FILE" 7400 PRINTTAB(2)"6. LIST RECORDS 7500 PRINTTAB(2)"7. PRINT CHECKS 7600 PRINTTAB(2)"B. EMPLOYER DAT A BASE" 7700 PRINTTAB(2)"9. COMPUTE PAYR OLL" 7800 PRINTTAB(1)"10. END PROGRAM 7900 PRINT: INPUT" ENTER ONE OF THE ABOVE"; Y 8000 ON Y GOTÓ12200,15500,16700,

22200,31000,32200,32700,32600,32 800.8200 8100 GOSUB33200:GOTO6700 8200 END 8300 8400 ' SUBROUTINE TO OPEN FI LE 8500 8600 OPEN"D",#1,"PAYROLL",212 8700 FIELD#1,12ASA\$,8ASB\$,1AS C\$,20ASD\$,12ASE\$,2ASF\$,5ASG\$,9ASH\$,1ASI\$,5ASJ\$,5ASK\$,5ASL\$,5ASM\$.5 ASN\$,5ASO\$,1ASP\$,5ASQ\$,5ASR\$.5AS S\$,5AST\$,5ASU\$,5ASV\$,5ASW\$,5ASX\$,5ASY\$,5ASZ\$,5ASA1\$,5ASA2\$,5ASA3 \$,5ASA4\$,5ASA5\$,5ASA6\$,5ASA7\$,5A SA8\$,5ASA9\$,11ASB2\$,5ASB3\$ 8800 RETURN 8900 ' 9000 ' LSET EMPLOYEE VARIABL FS. 9100 9200 LSETA*=LN*:LSETB*=GN*:LSETC 9300 LSETD\$=AD\$:LSETE\$=AC\$:LSETF

9400 LSETG\$=ZC\$:LSETH\$=SS\$:LSETI

9500 LSETJ\$=MKN\$(HW):LSETK\$=MKN\$

SUPPORT:

\$=5A\$

\$=DN\$

(sə-pôrt) v.t. **1**. To bear the weight of, especially from underneath; uphold in position; keep from failing, etc. **2**. To bear or sustain (weight; etc.) **3**. To keep from failing; strengthen: *PBJ*, *Inc. supports their product line with technical personnel that are always there to help you.* **4**. To serve, to uphold or corroborate (a statement, theory, etc.) substantiate; verify: *PBJ*, *Inc. receives testimonials on a daily basis that support their product line.* **5**. To provide (a person, institution) with maintenance; provide for: *PBJ*, *Inc. supports the CoCo user by consistently creating new advancements in their field.*

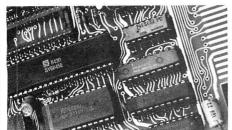
Synonym: PBJ, Inc.

A long description indeed, yet very applicable to the kind of service delivered by PBJ, Inc. When the serious CoCo user needs back-up support, technical information or assistance, PBJ, Inc. is there! From the products they manufacture through to the strategic solutions they offer, PBJ, Inc. has rightfully gained the reputation of "the company with *the most support* for the Color Computer."



"Innovative Products for the CoCo User"

Call or write today for our **FREE** Catalog ... P.O. Box 813 • North Bergen, N.J. 07047 • **201-330-1898**







```
TIAL) ": PC$="N"
(UD):LSETL$=MKN$(CM)
9600 LSETM$=MKN$(SP):LSETN$=MKN$
                                     12900 INPUTLN$, GN$, MI$
                                     13000 IFLN$="NO NAME"THEN14500
(GI):LSETO$=MKN$(CC)
                                     13100 PRINT"STREET ADDRESS"
9700 LSETS$=MKN$(SW):LSETT$=MKN$
(FW):LSETU*=MKN*(LW)
                                     13200 INPUTAD$
                                     13300 PRINT"CITY(12), STATE(2), ZI
9800 LSETV$=MKN$(SY):LSETW$=MKN$
                                     P CODE (5)"
(FY):LSETX$=MKN$(LY)
9900 LSETY$=MKN$(CY):LSETZ$=MKN$
                                     13400 INPUTAC$, SA$, ZC$
                                     13500 INPUT"SOCIAL SECURITY #":S
(UY):LSETR$=MKN$(TS)
10000 LSETA1 $= MKN $ (GY) : LSETA2 $= M
                                     13600 INPUT"NUMBER OF DEPENDANTS
KN$(ST):LSETP$=PC$
10100 LSETA3$=MKN$(PA):LSETA4$=M
                                     " : DN$
                                     13700 INPUT"HOURLY PAY RATE"; HW
KN$(PV):LSETA5$=MKN$(UA)
                                     13800 INPUT"UNION DUES RATE";UD
10200 LSETA6$=MKN$(VA):LSETA7$=M
KN$ (AA): LSETA8$=MKN$ (RH)
                                     13900 INPUT"COMMISSION RATE"; CM
10300 LSETA9$=MKN$(OH):LSETB2$=W
                                     14000 INPUT"SAVINGS PLAN AMOUNT"
E$:LSETQ$=MKN$(MW)
10400 LSETB3$=MKN$(GE)
                                     14100 INPUT"GROUP INSURANCE AMOU
10500 RETURN
                                     NT"; GI
                                     14200 INPUT"CHARITY AMOUNT";CC
10600
10700 '
            CONVERT 5 BYTE CODED
                                     14300 INPUT"ABSENCE DAYS ALLOWED
 STRING
                                     ": AA
10800 '
                                     14400 INPUT"VACATION DAYS ALLOWE
10900 HW=CVN(J$):UD=CVN(K$):CM=C
                                     D": VA
VN(L事)
                                     14500 INPUT"IS ALL INFORMATION C
11000 SP=CVN(M$):GI=CVN(N$):CC=C
                                     ORRECT"; X1$
VN(Os)
                                     14600 IFLEFT$(X1$,1)="Y"THEN1470
11100 SW=CVN(S$):FW=CVN(T$):LW=C
                                     ØELSE12700
VN(Us)
                                     14700 GOSUB8600:GOSUB9200
11200 SY=CVN(V$):FY=CVN(W$):LY=C
                                     14800 PUT#1.X
VN(X事)
                                     14900 CLOSE#1
11300 CY=CVN(Y$):UY=CVN(Z$):RH=C
                                     15000 INPUT"ANOTHER NEW FILE"; X1
VN(AB事)
11400 GY=CVN(A1$):ST=CVN(A2$):OH
                                     15100 IFX1$="Y"THEN12200ELSE6700
=CVN(A9s)
                                     15200 '
11500 PA=CVN(A3$):PV=CVN(A4$):UA
                                                 RESERVE FILE ROOM
                                     15300 '
=CVN(A5季)
                                     15400 '
11600 VA=CVN(A6$):AA=CVN(A7$):TS
                                     15500 GOSUB34000
=CVN(R#)
                                     15600 IFE2*="R"THEN15700ELSE6700
11700 MW=CVN(Q$):WE$=B2$:PC$=P$:
                                     15700 LN$="NO NAME": GOSUB8600
GE=CVN(B3$)
                                     15800 FORX=1T010
11800 RETURN
                                     15900 GOSUB9200
11900
                                     16000 PUT#1,X
12000 '
            CREATE A NEW FILE
                                     16100 NEXTX
12100 '
                                     16200 CLOSE#1
12200 CLS: GOSUB8600
                                     16300 GOTO6700
12300 FORX=1T010:GET#1,X
                                     16400 '
12400 IFLEFT$(A$,7)="NO NAME"THE
                                     16500 '
                                                READ DATA FILE
N12700ELSENEXTX
                                     16600 '
12500 CLS:PRINT:PRINT"NO SPARE R
                                     16700 CLS: OA=0: PRINTFP$:: PRINTTA
ECORDS LEFT. YOU MUST RESERVE MO
                                     B(10) "DATA READOUT": PRINTFP$:
RE RECORDS."
                                     16800 PRINT: INPUT"ENTER EMPLOYEE
12600 PRINT: INPUT"
                        PRESS <EN
                                      RECORD #"; ER$
TER> TO CONTINUE": Y: GOTO6700
                                     16900 IFER*="ALL"THEN17300ELSEIF
12700 CLOSE#1:CLS:PRINTSTRING$(3
                                     ER$="NONE"THEN6700
2,"#");:PRINTTAB(3)"ENTER EMPLOY
                                     17000 X=VAL(ER$): OA=1:IF X<10RX>
EE INFORMATION":PRINTSTRING$(32,
                                     10THENGOSUB33200:GOTO16700
"#");
                                     17100 GOSUB8600:GOTO17500
12800 PRINT"NAME (LAST, FIRST, INI
                                     17200 CLS:PRINTFP$::PRINTTAB(9)"
```





Memo Code: AØ Get Food For ST. PATRICKS PARTY 3/17/85

DUE DATE: MARCH 12,1985

ANNOUNCING

CALINDEX I

uses a single disk for all calendar entries. It is an excellant, low cost calendar for family or personnal use. Keep track of your appointments, and important dates such as birthdays, anniversarys, etc. with this perpetual calendar.

Each member of your family can have a separate calendar on the same disk, and all calendars can be scanned quickly and efficiently. A simplified chain of command feature allows entries not taken care of to be shown on the overdue file at the top of the supervisory ladder.

CALINDEX II

utilizes separate disks for calendar memo files and the database list function. CALINDEX II was designed for business, club and professional uses where it is necessary to supervise a number of people or projects. Detailed flow charts can be created and keyed into the calendar to supervise complex projects.

A sophisticated chain of command feature automatically bumps up the supervisory ladder entries not taken care of by the appropriate due date at lower levels. Four levels of authority and the potential for operating fifteen individual calendars provide a management at workhorse low cost.

BOTH CALINDEX I & II

are user friendly programs. They feature the ability to create and supervise up to fifteen individual calendars. The calendars can be used by individuals or can be different projects that you wish to supervise.

The CALINDEX features as listed to the right provide a power packed program that will make you and those who use the program more efficient. This translates into more leasure time, more money and more enjoyment out of life. Try it! If you are not satisfied we will happily refund your money.

FEATURES

- Easy to write file cards
- Chain of command supervisor
- Automatic tickler file
- Multiple calendar management
- Perpetual calendar entries
- · List creation feature
- Archive for satisified entries
- Automatic scan selection
- Uses standard printer



PLEASE SEND THIS PROGRAM!

Check One		PRICE
CALINDEX I: Single Disk	Personal/Family Calendar	
	lendar For Professional/Social Club/B	
NOTE: Both calendars require	minimun 32K + 1 Disk Drive	
Please Send To:		
NAME		
ADDRESS		
CITY	STATE	ZIP
My check for	is enclosed (Calif. residents add 6.	5% sales tax)

READ DATA FILE": PRINTFP\$; 17300 GOSUB8600 17400 FORX=1TO10 17500 GET#1,X:GOSUB10900 17600 PRINT#-2,LP\$; "DISK FILE RE CORD #":X:SP\$ 17700 IFLEFT\$ (A\$,7) = "NO NAME"THE NPRINT#-2,A\$: GOTO21700 17800 PRINT#-2.LF\$; LP\$; "EMPLOYEE NAME AND ADDRESS": SP\$; LF\$ 17900 PRINT#-2,A\$; B\$; C\$ 18000 PRINT#-2,D\$ 18100 PRINT#-2,E\$", "F\$" "G\$ 18200 PRINT#-2,LF\$ 18300 PRINT#-2, LP\$; "EMPLOYEE STA TUS":SP\$:LF\$ 18400 PRINT#-2, "SOCIAL SEC. #", " DEPENDANTS", "HOURLY WAGE", "COMMI SSION" 18500 PRINT#-2, H\$; TAB(25) I\$; TAB(42) "";:PRINT#-2,USING"\$\$###.##"; HW::PRINT#-2,TAB(65)CM*100;"%" 18600 PRINT#-2 18700 PRINT#-2, "UNION DUES", "SAV INGS PLAN", "GROUP INSUR. ", "CONTR IBUTIONS" 18800 PRINT#-2,USINGF1\$;UD;SP;GI

18900 PRINT#-2,LP\$;LF\$;LF\$: "WITH HOLDING THIS PAY PERIOD": LF\$: SP\$ 19000 PRINT#-2, "SOCIAL SEC.", "FE D. INC. TAX", "STATE TAX", "MISC. WI THHELD" 19100 MW=SP+CC+GI+UD:IFPC\$="N"TH ENMW=0 19200 PRINT#~2,USINGF1\$;SW;FW;LW : MW 19300 PRINT#-2 19400 PRINT#-2, LP\$; LF\$; "YEAR-TO-DATE WITHHOLDING"; LF\$; SP\$ 19500 PRINT#-2, "SOCIAL SEC.", "FE D. INC. TAX", "STATE TAX", "CONTRIBU TIONS" 19600 PRINT#-2, USINGF1#; SY; FY; LY 19700 PRINT#-2 19800 PRINT#-2, "UNION DUES", "GRO UP INSUR.", "SAVINGS PLAN". "GROSS EARNINGS" 19900 PRINT#-2, USINGF1#; UY; GY; ST 20000 PRINT#-2, LF\$; LF\$; LP\$; "EMPL OYEE ATTENDANCE"; LF\$; SP\$ 20100 PRINT#-2,"ABSENCE ALLOWED" "PAID ABSENCE", "UNPAID ABSENCE"

20200 PRINT#-2, TAB(4) AA"DAYS", PA

NEW! For PC Jr. Over 1000 Full Time Audio Interactive Tutorial Programs!



; CC





We're Your Educational Software Source for Grades K-12 and Advanced Studies

No. of Programs
256
128
48
32
16
16
16

16 Programs in each of the following:

Children's Tales - Carpentry - Electronics -Health Services - Office Skills - Statistics -First Aid/Safety - Economics - Business -Accounting - Psychology - AND MANY MORE! Dealer Inquiries Welcome

* 500 Programs Available for TRS 80 Color; 400 for IBM PC Jr.

Full-Time Audio Narration with Pictures and Text!

All of our computer programs have easy to understand professional announcer narration. All text is displayed in easy to read upper - and lower-case characters. Video clearly illustrates key concepts in each frame of the program. Only \$4.40 per program (\$8.80 for 2, one on each side of a half-hour cassette). \$59.90 for 16 programs (8 cassettes) in an album.

For your Apple II, you will need the plug-in Dorsett M402 T/T plug-in board, \$99.00, and the M401 stereo cassette player, \$79.00. For your Atari 400/600/800/1200, you will need the Atari cassette recorder and the Dorsett 4001 Educational Master Cartridge, \$9.95. All programs listed are available for TRS 80 I/III/4, which require the M203 speaker converter, \$99.00, and 401 stereo cassette player, \$79.00. For the PC Jr. a cassette adapter cable and a good

Send for a catalog of over 1000 programs for Atari, TRS 80, Apple, IBM PC Jr., Commodore, etc.

cassette recorder is required. A Radio Shack CCR-81 or CCR-82 is recommended.

For more information, write or call: (Dealer inquiries welcome)

TOLL FREE 1-800-654-3871 IN OKLAHOMA (405) 288-2301

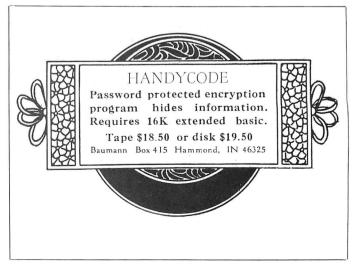




"DAYS" , UA "DAYS" 20300 PRINT#-2, LF\$; "VACATION ALL OWED", "VACATION USED" 20400 FRINT#-2.TAB(4)VA"DAYS".PV "DAYS" 20500 PRINT#-2,LP\$;LF\$; "PAYC HECK FOR WEEK ENDING ": WES; LFS; S 20600 IFPC\$="N"THENPRINT#-2,LP\$; "NO PAYCHECK THIS PERIOD":SP\$:PR INT#-2,STRING\$(20,10):GOTO21700 20700 PRINT#-2,"REGULAR HOURS"," OVERTIME HOURS" 20800 GA=(RH+(OH*1.5))*HW+(TS*CM 20900 TW=MW+FW+SW+LW 21000 PT=GA-TW 21100 PRINT#-2, TAB(6)RH; TAB(25)0 21200 PRINT#-2 21300 PRINT#-2, "TOTAL SALES", "GR OSS AMOUNT", "TOTAL WITHHELD", "NE T AMOUNT" 21400 PRINT#-2.USINGF1\$; TS; GA; TW :PT 21500 PRINT#-2,STRING\$(16,10) 21600 IFOA=1THENCLOSE#1:GOTO6700 21700 IFOA=1THENCLOSE#1:GOTO6700 :ELSENEXT X:CLOSE#1 21800 GOTO6700 21900 ' 22000 ' EDIT EMPLOYEE FILE 22100 ' 22200 CLS:PRINTFP\$::PRINTTAB(7)" EDIT EMPLOYEE FILE": PRINTFP\$; 22300 PRINT: INPUT"ENTER EMPLOYEE RECORD #":X 22400 IFX<1THEN6700 22500 GOSUB8600:GET#1,X:GOSUB109 22600 CLS:PRINTFP\$;:PRINTTAB(7)" EDIT EMPLOYEE FILE": PRINTFP\$ 22700 PRINT@130,"1.EMPLOYEE NAME AND ADDRESS" 22800 PRINTTAB(2)"2.EMPLOYEE PAY STATUS" 22900 PRINTTAB(2)"3.WITHHOLDING THIS PAY PERIOD" 23000 PRINTTAB(2)"4.WITHHOLDING YEAR-TO-DATE" 23100 PRINTTAB(2)"5.EMPLOYEE ATT ENDANCE RECORDS" 23200 PRINTTAB(2) "6. PAYROLL COMP "VOITATU 23300 PRINTTAB(2)"7.END EDIT FUN CTION" 23400 PRINT: INPUT" ENTER ONE OF THE ABOVE"; OA

23500 CLS:ON OA GOTO24000,25100,

26600,27500,28500,29800,30600 23600 GOSUB33200:GOTO22200 23700 23800 ' EDIT EMPLOYEE NAME & **ADDRESS** 23900 ' 24000 PRINTFP\$::PRINTTAB(2)"EDIT EMPLOYEE NAME & ADDRESS":PRINTF 24100 PRINT: PRINT"ENTER EMPLOYEE NAME": PRINT" (LAST, FIRST, INITIA 24200 INPUTLNs.GNs.MIs:IFLNs=""T HEN24300ELSELSETA\$=LN\$:LSETB\$=GN *: LSETC*=MI* 24300 PRINT: PRINT"ENTER EMPLOYEE STREET ADDRESS" 24400 INPUTADs: IFADs=""THEN24500 ELSELSETD#=AD# 24500 PRINT: PRINT"ENTER CITY (12),ST (2),ZIP (5)" 24600 INPUTAC*, SA*, ZC*: IFAC*=""T HEN24700ELSELSETE\$=AC\$: LSETF\$=SA \$:LSETG\$=ZC\$ 24700 GOTO22600 24800 24900 ' EDIT EMPLOYEE PAY ST ATUS 25000 ' 25100 PRINTFP\$::PRINTTAB(6) "EDIT EMPLOYEE PAY STATUS": PRINTFP\$ 25200 PRINT: PRINT"ENTER SOCIAL S ECURITY NUMBER": INPUTSS\$ 25300 IFSS*=""THEN25400ELSELSETH \$=55\$ 25400 PRINT"ENTER NUMBER OF DEPE NDANTS": INPUTDN\$ 25500 IFDN\$=""THEN25600ELSELSETI 25600 PRINT"ENTER HOURLY WAGE": I NPUTB1\$: IFB1\$=""THEN25700ELSELSE TJ\$=MKN\$(VAL(B1\$))



28200 PRINT"ENTER SAVINGS TOTAL" 25700 PRINT"ENTER UNION DUES": IN :INPUTB1\$:IFB1\$=""THEN28300ELSEL PUTB1\$: IFB1\$=""THEN25800ELSELSET SETA2s=MKNs(VAL(B1s)) K\$=MKN\$(VAL(B1\$)) 28300 PRINT"ENTER GROSS EARNINGS 25800 PRINT"ENTER COMMISSION PER ": INPUTB1\$: IFB1\$=""THEN28400ELSE CENT": INPUTB1\$: IFB1\$=""THEN25900 LSETB3*=MKN*(VAL(B1*)) ELSELSETL\$=MKN\$(VAL(B1\$)/100) 25900 PRINT"ENTER SAVINGS DEDUCT 28400 GOTO22600 ION": INPUTB1\$: IFB1\$=""THEN26000E 28500 ' EDIT EMPLOYEE ATTEND 28600 ' LSELSETM#=MKN#(VAL(B1#)) ANCE RECORD" 26000 PRINT"ENTER GROUP INSURANC E": INPUTB1\$: IFB1\$=""THEN26100ELS 28700 ' ELSETN*=MKN*(VAL(B1*)) 28800 PRINTFP\$::PRINTTAB(4)"EDIT EMPLOYEE ATTENDANCE": PRINTFP\$ 26100 PRINT"ENTER CHARITY DEDUCT 28900 PRINT"EDIT ABSENCE DAYS AL ION": INPUTB1\$: IFB1\$=""THEN26200E LOWED": INPUTB1\$: IFB1\$=""THEN2900 LSELSETO\$=MKN\$(VAL(B1\$)) ØELSELSETA7 \$= MKN \$ (VAL (B1 \$)) 26200 GOTO22600 26300 29000 PRINT"EDIT PAID ABSENCE": I NPUTB1#: IFB1#=""THEN29100ELSELSE 26400 ' EDIT WITHHOLDING THI S PAY PERIOD TA3s=MKNs(VAL(B1s)) 29100 PRINT"EDIT VACATION ALLOWE 26500 D": INPUTB1\$: IFB1\$=""THEN29200ELS 26600 PRINTFP\$::PRINT"EDIT WITHH ELSETA65=MKN\$(VAL(B1\$)) OLDING THIS PAY PERIOD"; FP\$ 26700 PRINT"EDIT SOC. SEC. WITHH 29200 PRINT"EDIT VACATION USED": INPUTB1*: IFB1*=""THEN29300ELSELS ELD": INPUTB1\$: IFB1\$=""THEN26800E ETA4*=MKN*(VAL(B1*)) LSELSETS\$=MKN\$(VAL(B1\$)) 26800 PRINT"EDIT FICA WITHHELD": 29300 PRINT"EDIT UNPAID ABSENCE" INPUTB1*: IFB1*=""THEN26900ELSELS : INPUTB1 \$: IFB1 \$= " "THEN 29400ELSEL ETT\$=MKN\$(VAL(B1\$)) SETA5*=MKN*(VAL(B1*)) 26900 PRINT"EDIT STATE TAX WITHH 29400 GOTO22600 ELD": INPUTB1\$: IFB1\$=""THEN27000E 29500 ' LSELSETU\$=MKN\$(VAL(B1\$)) 29600 ' EDIT PAYROLL COMPUTA 27000 PRINT"EDIT MISC. WITHHOLDI TION NG": INPUTB1#: IFB1#=""THEN27100EL 29700 SELSETQ\$=MKN\$(VAL(B1\$)) 29800 PRINTFP\$;:PRINTTAB(4)"EDIT 27100 GOTO22600 PAYROLL COMPUTATION": FRINTFP* 27200 29900 PRINT"REGULAR HOURS": INPUT 27300 ' B1*: IFB1*=""THEN30000ELSELSETAB* EDIT YEAR-TO-DATE WI THHOLDING =MKN\$(VAL(B1\$)) 27400 30000 PRINT"OVERTIME HOURS": INPU 27500 PRINTFP\$;:PRINT" EDIT YEAR TB1\$: IFB1\$=""THEN30100ELSELSETA9 \$=MKN\$(VAL(B1\$)) -TO-DATE WITHHOLDING":PRINTFP\$ 30100 PRINT"TOTAL SALES": INPUTB1 27600 PRINT"ENTER SOC. SEC. TOTA \$: IFB1\$=""THEN30200ELSELSETR\$=MK L": INPUTB1\$: IFB1\$=""THEN27700ELS ELSETV\$=MKN\$(VAL(B1\$)) N*(VAL(B1*)) 27700 PRINT"ENTER FICA TOTAL": IN 30200 GOTO22600 PUTB1\$: IFB1\$=""THEN27800ELSELSET 30300 ' W#=MKN# (VAL (B1#)) 30400 ' END EDIT FUNCTION 30500 27800 PRINT"ENTER STATE TAX TOTA 30600 PUT#1, X:CLOSE#1:GOTO6700 L": INFUTB1\$: IFB1\$=""THEN27900ELS ELSETX\$=MKN\$(VAL(B1\$)) 30700 27900 PRINT"ENTER CONTRIBUTIONS 30800 MOVE EMPLOYEE FILE 30900 TOTAL": INPUTB1\$: IFB1\$=""THEN2800 31000 CLS:PRINTFP\$;:PRINTTAB(6)" ØELSELSETY\$=MKN\$(VAL(B1\$)) 28000 PRINT"ENTER UNION DUES TOT MOVE EMPLOYEE RECORD": PRINTFP\$ AL": INPUTB1\$: IFB1\$=""THEN28100EL 31100 GOSUB8600: PRINT: INPUT"ENTE R OLD EMPLOYEE RECORD #":PR\$ SELSETZ\$=MKN\$(VAL(B1\$)) 31200 IFPR\$="NONE"THEN6700ELSEPR 28100 PRINT"ENTER GROUP INS. TOT AL": INPUTB1\$: IFB1\$=""THEN28200EL =VAL (PR\$) SELSETA1\$=MKN\$(VAL(B1\$)) 31300 GET#1,PR:PRINT"RECORD #"PR

SQUEEZE MORE OUT OF EVERY ON-LINE MINUTE.

WITH NEW VIDTEX™
COMMUNICATIONS SOFTWARE
FROM COMPUSERVE.

Presenting the software package that makes your Tandy® Color Computer more productive and cost-efficient.

New Vidtex™ from CompuServe has unparalleled intelligence to let your computer communicate more efficiently and economically with most bulletin boards and time sharing services (including CompuServe's Information Service).

Here are just a few of the features Vidtex provides to bring your on-line hours in line.

Auto-Logon. Lets you log on quickly and simply by utilizing prompts and responses pre-defined by you. Also allows initiation of command files after logging on.

Error-Free Uploading and Downloading. CompuServe "B" Protocol contained in Vidtex lets you transfer to or from disk or cassette and CompuServe

host with guaranteed data integrity despite line noise. Also provides error-free downloading from CompuServe's extensive software libraries, including the Color Computer SIG (GO COCO) and Rainbow on Tape (GO SOFTEX).

10 Function Keys. Let you consolidate long commands into single keystrokes. Definitions can be saved to and loaded from disk, allowing multiple definitions for different applications.

Capture Buffer. Saves an on-line session in memory to review or use later. Contents can be loaded from or saved to disk; displayed both on and off line; or dumped to your printer at any baud rate.

On-Line Graphics. Feature run-length compression for faster transmissions. Displays stock charts, weather maps and more.

Full ASCII Keyboard. All 128 ASCII

characters can be generated, as well as many built-in local functions, such as inverse video, disk directory, communications parameters, etc.

Timely Updates. Keep you informed on latest Vidtex developments at low cost.

New Vidtex is available on disk (#55122) or cassette (#55123) for only \$39.95. Both versions require a 32K Color Computer or CoCo II (cassette or disk drive) and a 300 baud modem.

If you are already a CompuServe subscriber, you can order Vidtex on line by using the GO ORDER command. Otherwise, check with your nearest computer dealer; or to order direct, call or write:

CompuServe

P.O. Box 20212, 5000 Arlington Centre Blvd, Columbus, Ohio 43220

1-800-848-8199 In Ohio, call 614-457-0802

An H&R Block Company.

Falsoft to the Rescue . . .

. . . with The Rainbow Bookshelf

Don't take it out on your local bookseller if you've been frustrated by his woeful supply of books on the Color Computer. There just haven't been enough in circulation.

Help is on the way. The same folks who bring you THE RAINBOW are, right now, poring over new manuscripts, considering new concepts, and identifying critical areas of need. There will be fun books, packed with all-new games and informative programs, and books of a more serious nature to help you take full advantage of the Color Computer's capacity.



— The Rainbow Book of Simulations is the newest addition to the bookshelf, featuring award winners from THE RAINBOW's very first Simulation contest. You will carve your niche in history as the President of the United States, change the course of the Civil War, be on the hot seat as Chairman of a major U.S. corporation, save a town from flooding, learn sailing maneuvers or engage in a sea battle. Twenty new Simulations — realistic, challenging and fun.

Book \$9.95 Tape \$9.95 — Coming soon is **The Complete Rainbow Guide to OS-9**, by Dale Puckett and Peter Dibble. This comprehensive new publication, packed with programs, demystifies the system through a step-by-step process. Two of the foremost authorities fully explore the incredible potential of this multifaceted new operating system.

Book \$19.95 Two Disk Package \$31.00 — Copies are still available of **The Rainbow Book of Adventures**, which includes all 13 winners from THE RAINBOW's first Adventure contest. A sure collector's item, the entries include all the elements of the classic Aventures, including the allure of a tropical island, the zany antics of a mad scientist, smoking dragons, winding hallways, neverending forests, explosions, traps, tricks, mindbenders, and more.

Book \$7.95 Tape \$7.95

Order both! The books provide comprehensive instructions often needed to load the programs. The tape/disk saves you hours of time required to key in lengthy listings.

Keep your library up to date. Order now!



I want to start my own	Falsoft, Inc. The Falsoft Building
Rainbow Bookshelf!	9529 U.S. Highway 42 P.O. Box 385
Please send me: The Rainbow Book of Simulations Rainbow Simulations Tape The Complete Rainbow Guide to C Rainbow Guide to OS-9 Two Disk F The Rainbow Book of Adventures Rainbow Adventures Tape Add \$1 per book Shipping and H Canada and Mexico Add \$2.00 All Other Foreign Add \$4.00	\$ 31.00 \$ 7.95 \$ 7.95
	Total
Name	
	ate ZIP
Payment Enclosed VISA MasterC	ard
Account Number	Interbank No. (MC Only)
Signature	Card Expiration Date

(Allow 4 weeks for delivery)

31400 PRINTA#; B#; C#: INPUT" IS THI S INFORMATION CORRECT (Y/N)": OA\$ 31500 IFOA = "Y"THEN 31600 ELSE 3100 31600 PRINT: INPUT"ENTER NEW RECO RD #":NR 31700 GET#1,NR:IFLEFT\$(A\$,7)<>"N O NAME "THENGOSUB33200:CLOSE#1:EL SEGOTO31000 31800 GET#1,PR:PUT#1,NR:CLOSE#1: GOT06700 31900 ' 32000 ' LIST RECORDS 32100 32200 CLS:PRINTFP\$;:PRINTTAB(10) "RECORDS LIST": PRINTFP\$: GOSUB860 Ø:FORX=1TO1Ø:GET#1,X 32300 PRINT"REC#"X; TAB(8) A\$; B\$; C FRE 32400 NEXTX:CLOSE#1:INPUT" SS <ENTER> TO CONTINUE": OA 32500 GOTO6700 32600 CLS:PRINTFP\$;:PRINTTAB(8)" ONE MOMENT PLEASE": PRINTFP\$: RUN" EMPLOYER" 32700 CLS:PRINTFP\$::PRINTTAB(8)"

ONE MOMENT PLEASE": PRINTFP\$: RUN" COMPUTE" 32900 33000 ERROR ROUTINE 33100 33200 FOR X=1 TO 10:CLS 33300 FOR T=1 TO 50:NEXT T 33400 PRINT@233."ILLEGAL ENTRY": SOUND 100,1 33500 FOR Y=1 TO 50:NEXT Y,X:CLS : RETURN 33600 RETURN 33700 33800 WARNING ROUTINE 33900 34000 CLS:PRINTFP\$;:PRINTTAB(12) "warning":PRINT:PRINT" RESERVING DISK FILE SPACE WILL DESTROY ANY PAYROLL RECORDS RENTLY ON DISK!!":PRINT:PRINTFP\$ 34100 FORX=1TO20:SOUND100,1:FORY =1TO20:NEXTY,X 34200 PRINT:PRINT"PRESS <ENTER> TO RETURN TO MENU" 34300 PRINT"PRESS r TO RESERVE S PACE" 34400 E2\$=INKEY\$:IFE2\$=""THEN344

One-Liner Contest Winner . . .

CKWRITER"

One of these days when you run out of things to do with your printer, you can use this one-liner to print diskette jackets. The program should work with any ordinary printer. After printing, cut along the dotted line, fold the two halves together and fold and tape the tabs.

ONE MOMENT PLEASE": PRINTFP\$: RUN"

32800 CLS:PRINTFP\$;:PRINTTAB(8)"

The listing:

1 FORI=1TO71:PRINT#-2,".";:NEXT: PRINT#-2," ":FORI=1TO22:PRINT#-2 ,".";TAB(7);".";TAB(63);".";TAB(70);".";TAB(70);".";TAB(63);".";TAB(70);".";NEXT:FORI=1TO71:PRINT#-2 ,".";:NEXT:PRINT#-2," ":FORI=1TO 28:PRINT#-2,TAB(7);".";TAB(63);".";NEXT:PRINT#-2,TAB(7);:FORI=7T 063:PRINT#-2,".";:NEXT:END

> George Yeager Saint Albans, WV

(For this winning one-liner contest entry, the author has been sent copies of both *The Rainbow Book Of Simulations* and its companion *Rainbow Simulations Tape.*)

One-Liner Contest Winner . . .

This is a skiing game using the right joystick. Move your skis left or right as you go down the mountain. Try to pass between the flags. The game ends when you knock down 10 flags.

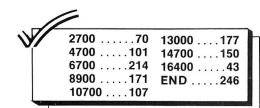
The listing:

ØØELSERETURN

1 S=RND(15):PRINT@S+487,"^ ^";:F ORX=1T09:Z=INT(JOYSTK(0)/22)-1:R =R+Z:PRINT@507,G"yyyy"P;:PRINT@2 00+R,"#";:PLAY"T15A":NEXT:IFR=S THENPLAY"B":P=P+5:GOT01ELSEP=P-1 :IFR+1=S ORR-1=S THENPLAY"FD":PR INT@199+R,"_";:G=G+1:IFG=10THENP RINTG ELSE1ELSE1

> Kevin Derby Lubbock, TX

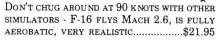
(For this winning one-liner contest entry, the author has been sent copies of both *The Rainbow Book Of Simulations* and its companion *Rainbow Simulations Tane.*)



Listing 2: **Employer** 1000 ' EMPLOYER 1100 ' EMPLOYER DATA BASE PR OGRAM FOR PAYROLL PACKAGE 1200 BY DENNIS H. WEIDE 1300 ' COPYRIGHT 1983 1400 ' 1500 1600 CLS:CLEAR1000:POKE153,20:F1 ":DIMMN\$(**\$="\$\$#####**### 12):GOTO3900 1700 1800 1900 BUFFER #2-EMPLOYER VA 2000 RIABLES

FLY at MACH 2!

F-16 Instrument Flight Simulator





TSPOOL - SOFTWARE SPOOLER FOR TELEWRITER-64®	ONLY. INCLUDES
Descenders	\$24.95

			_ 1.00
TELEWRITER-64	TAPE\$49.94	Disk	\$59.95

ELITE CALC THE BEST CoCo Spreadsheet.....\$59.95

ELITE FILE THE BEST CoCo Database.....\$74.50

NEW: CoCo WORLD™

OUR SOFTWARE CATALOG

Tired of seeing fabulous ad pictures that don't resemble the program at all? Wonder what the programs really do? Our catalog is on tape or disk and contains detailed explanations of programs, demo programs & graphics, along with reviews & articles for you. Send \$2.00 & we will rush you our latest information. Please specify 16/64K tape or disk. Note: Any Software Author may advertise in our catalog at nominal cost; contact us for details.

Call (813) 321-2840 9-5 pm EST for ordering or information.

KRT Software Inc.
P. O. Box 41395
St. Petersburg, Florida 33743







5500 RETURN

2100 '		
2200 '(D1\$)	9	MO\$=PAYROLL MO
NTH	,	1704 1 111110111 110
2300 ′(D2\$)	5	PT =EMPLOYER P
AYROLL TOTAL	J	PI -EMPLOTENT
2400 (D3\$)	5	PY =EMPLOYER P
	J	FT -ENFLOTER F
AYROLL Y-TO-D	-	TO THE OVER O
2500 '(D4\$)	5	T2 =EMPLOYER S
S TOTAL	-	
2600 (D5\$)	5	YS =EMPLOYER S
S Y-TO-D		
		TF =EMPLOYER T
OTAL FED. INC.	TA	×Χ
2800 (D7\$)	5	YF =EMPLOYER T
OTAL FED. INC.	TAX	YF =EMPLOYER T Y-TO-D
2900 ′(D8\$)	5	TU =TOTAL UNIO
N DUES THIS PA		
30 00 ′ (D9≢)	5	TC =TOTAL CHAR
ITY CONTRIB TH	IS	PAY PERIOD
3100 '(E1\$)	5	YC =TOTAL CHAR
ITY CONTRIB Y-	TO-	-D
3200 '(E2\$)	5	YL =TOTAL STAT
E INC. TAX Y-T		
		TL =TOTAL STAT
E INC. TAX		
3400 '(E4\$)	5	IT =INSURANCE
TOTAL	J	II - INCOMMICE
3500 '(E5\$)	5	IY = INSURANCE
Y-TO-D	w	II -INDOMMAGE
3600 '		
	TDO	L CODES
	IKU	JL CODES
3800 '	4 (74.)	101010101
		:LF\$=CHR\$(31):S
		STRING\$(32,"#")
		READMN\$(X):NEXTX
4100 GOTO6700		
4200 '		
	KUU	JTINE TO OPEN FI
LE BUFFER		
4400 '		
4500 OPEN"D",#		
)1≢,5ASD2≢,5ASD3
\$,5ASD4\$,5ASD5	\$,5	SASD6\$,5ASD7\$,5A
SD8\$,5ASD9\$,5A	SE1	\$,5ASE2\$,5ASE3\$
,5ASE4\$,5ASE5\$		
4700 RETURN		
4800 '		
4900 ' LSE	TE	MPLOYER VARIABL
ES	-	
5000 '		
	.15	SETD1\$=MO\$:LSETD
2\$=MKN\$(PT):LS		
		(T2):LSETD5\$=MK
N#(YS):LSETD6#		
		S(YF):LSETD8\$=MK
N\$(TU):LSETD9\$		
		(YC):LSETE2\$=MK
N\$(YL):LSETE3\$	=MK	N¥(IL)

5600 5700 CONVERT 5 BYTE CODED STRING 5800 5900 PT=CVN(D2\$):PY=CVN(D3\$):T2= CVN(D4\$): YS=CVN(D5\$) 6000 TF=CVN(D6\$):YF=CVN(D7\$):TU= CVN(D8\$): TC=CVN(D9\$) 6100 YC=CVN(E1\$):YL=CVN(E2\$):TL= CVN(E3\$): IT=CVN(E4\$) 6200 IY=CVN(E5\$):MO\$=D1\$ 6300 RETURN 6400 6500 EMPLOYER DATA BASE PR OGRAM 6600 6700 CLS:PRINTFP\$::PRINTTAB(3)"E MPLOYER DATA BASE PROGRAM" 6800 PRINTFP\$:PRINTTAB(10)"PROGR AM MENU" 6900 PRINT: PRINTTAB (5) "1. RESERV E FILE SPACE" 7000 PRINTTAB(5)"2. RETREIVE DAT A RECORD" 7100 PRINTTAB(5)"3. EDIT DATA RE CORD" 7200 PRINTTAB(5)"4. COMPUTE PAYR OLL" 7300 PRINTTAB(5)"5. WRITE CHECKS 7400 PRINTTAB(5)"6. EMPLOYEE DAT A BASE" 7500 PRINTTAB(5)"7. END PROGRAM" 7600 PRINT: INPUT" ENTER ONE O F THE ABOVE": DA 7700 ON OA GOTO8300,9500,12400,1 7200,17300,17400,7900 7800 GOSUB17800:GOTO6700 7900 END 8000 8100 RESERVE FILE SPACE 8200 8300 GOSUB18500: IFE2\$="R"THEN840 ØELSE6700 8400 CLS: PRINT: PRINTTAB (6) "RESER VING FILE SPACE" 8500 GOSUB4500:GOSUB5100 8600 FORX=1T012:LSETD1\$=MN\$(X) 8700 PUT#2, X: NEXTX: CLOSE#2: RESTO RE: GOTO6700 8800 8900 DATA STATEMENTS 9000 9100 DATAJANUARY, FEBRUARY, MARCH, AFRIL, MAY, JUNE, JULY, AUGUST, SEPTE MBER, OCTOBER, NOVEMBER, DECEMBER



Eliminates anxiety for individuals Saves time for professionals

> Starting From:

Supports

Costs Forms 1040A, 1040EZ Micro \$39.95 Mini Schedule A, B, W Forms 1040, 1040A, 1040EZ \$49.95 Professional Form 1040, 1040A, 1040EZ 2106, 2119, 3903, 4797 Schedule A, B, C, D, E, G, SE, W Office at Home, Installment Gain, Dependency Support, Credits and Other Taxes \$149.95

All Versions Feature:

Versions

- Full reverse-screen scrolling
- Forward-screen block scroll
- Calculator mode supports +, -, *, /, = on numeric data
- Continual edit capability
- Printouts on government-approved forms or plain paper for use with overlays
- Full on-line diagnostics on data input
- Runs on 32K extended Basic (one disk drive with change of diskette or two disk drives)

Easy to Use Just answer the questions.

Easy to File One diskette per taxpayer.

Easy to Upgrade CoCo Professional Taxpayer 1984 updates available for only \$59.95.

Mail to: Micro Dat 6 Edward Ashland,	Drive	☐ CoCo Pr ☐ Mini Ta ☐ Micro Ta		
☐ Mastercard	□ Visa	☐ Check or Mo	ney Order	Enclosed
Card #		_ Exp. Date		
Name				
Address				
City		State	Zip	
Signature				
I need the built-in Mass. residents add 5% sales	sales tax table fo	or		(state).



9200 RETREIVE DATA RECORD 9300 9400 9500 CLS:PRINTFP\$::PRINTTAB(6)"R ETREIVE DATA RECORD": PRINTFP\$ 9600 PRINT: PRINT: INPUT"ENTER REC ORD MONTH": M1\$: F2=0 9700 IFM1 = "ALL "THEN 10200 ELSEIFM 1#="NONE"THEN6700 9800 GOSUB4500:FORX=1T012 9900 IFLEFT\$ (MN\$ (X) , 3) = LEFT\$ (M1\$,3) THENGET#2, X: X=12: F2=1 10000 NEXTX: IFF2=0THENCLOSE#2:GO SUB17800: GOTO9500 10100 GOSUB5900:GOSUB10700:CLOSE #2:GOT06700 10200 GOSUB4500:FORX=1T012:GET#2 , X 10300 GOSUB5900:GOSUB10700:NEXTX :CLOSE#2:GOTO6700 10400 PRINT DATA RETREIVAL 10500 10600 10700 PRINT#-2, LF\$; LF\$; "EMPLOYER RECORD FOR "MO\$ 10800 PRINT#-2, LF\$; LF\$; "MONTHLY TOTALS"; LF#; SP# 10900 PRINT#-2,"PAYROLL TOTAL","

10 DISKETTES 20 C-20 CASSETTES

A subscription to the 'Coco-Cassette' gets you a tape or disk full of 10 quality programs delivered to you by first class mail every month. The documentation included will help you run great utilities like 'Word Processor,' and 'Budget Analyzer,' or enjoy great games like 'Frogjump' and 'Caterpillar Cave' FOR AS LITTLE AS 46 CENTS EACH!

★ Limited offer ★ Subscribe for a year on cassette and receive 20 Free C-20 cassettes or subscribe for a year on disk and receive 10 Free 51/4 single sided double density diskettes!

Now available on disk!



PRICES TAPE DISK 1 YR (12 ISSUES) 55°° 70°° 6 MO (6 ISSUES) 3000 4000 Single Copies 800

★ 16K extended required

Overseas ADD \$10 to subscription ★ Some programs require 32K, and/or disk

and \$1.00 to single issues. ★ Over 3000 satisfied customers

★ Back issues available from July '82 PERSONAL CHECKS WELCOME! (over 280 programs to choose from!)

★ Also available for Commodore 64.



T & D Subscription Software P.O. BOX 256-C HOLLAND, MI 49423 VISA (616) 396-7577

Mich. Res. add 4%

SOC. SEC. TOTAL", "FED. INC. TAX", "ST ATE TAX TOTAL" 11000 PRINT#-2, USINGF1*; PT; T2; TF ; TL 11100 PRINT#-2, LF\$; LF\$; LP\$; "YEAR -TO-DATE TOTALS"; LF#; SP# 11200 PRINT#-2, "PAYROLL TOTAL", " SOC.SEC.TOTAL", "FED.INC.TAX", "CO NTRIBUTIONS" 11300 PRINT#-2, USINGF1\$; PY; YS; YF ; YC 11400 PRINT#-2, LF\$; LF\$; "STATE TA X TOTAL", "INSURANCE TOTAL" 11500 PRINT#-2,USINGF1\$;YL;IY 11600 PRINT#-2, LF\$; LF\$; LP\$; "PAY PERIOD TOTAL":LF\$;SP\$ 11700 PRINT#-2, "UNION DUES", "CON TRIBUTIONS", "INSURANCE TOTAL" 11800 PRINT#-2,USINGF1\$; TU; TC; IT 11900 PRINT#-2,STRING\$(36,10) 12000 PRINT#-2, LF\$; LF\$; LF\$; LF\$: R ETURN 12100 12200 EDIT DATA RECORDS

12300 '

12400 CLS:PRINTFF's; TAB(8) "EDIT D ATA RECORDS": PRINTFP\$;

12500 FRINT: PRINT: INPUT"ENTER MO NTH TO EDIT": M1\$

12600 IFM1 = "NONE" THEN 6700

12700 GOSUB4500:F2=0

12800 FORX=1T012

12900 IFLEFT\$ (M1\$,3)=LEFT\$ (MN\$ (X) 3) THENRN=X: F2=1

13000 IFF2=0THENGOSUB17800:CLOSE #2:GOT012400

13100 GET#2,RN:GOSUB5900

13200 CLS:PRINTFP#;:PRINTTAB(10)

"EDITOR MENU":PRINTFP\$

13300 PRINT:PRINTTAB(2)"1. EDIT MONTHLY TOTALS"

13400 PRINTTAB(2)"2. EDIT YEAR-T O-DATE TOTALS"

13500 PRINTTAB(2)"3. EDIT PAY PE RIOD TOTALS"

13600 PRINTTAB(2)"4. END EDIT FU NCTION"

13700 PRINT: INPUT" ENTER ONE O F THE ABOVE"; OA

13800 ON OA GOTO14300,15100,1610 0,16900

13900 GOSUB17800:GOTO13200

14000

14100 ' EDIT MONTHLY TOTALS 14200

14300 CLS:PRINTFP\$; TAB(6) "EDIT M ONTHLY TOTALS": PRINTFP#: PRINT 14400 PRINT"PAYROLL TOTAL":: INPU TB1#: IFB1#=""THEN14500ELSEPT=VAL

DYNACALC®

CoCo's Best & Fastest Spreadsheet System ACCLAIMED BY THE EXPERTS

"DYNACALC is my choice for a CoCo spreadsheet." Dan Downard, RAINBOW, September, 1984.

"Eat your heart out, Lotus 1-2-3!" Scott Norman, HOT CoCo, October, 1984.

Built-in Features:

- 51 x 24 Display with Lower Case
- Super-fast Smart Screen Refresh
- Auto-Repeat Keyboard Driver
- Keysaver (TM) repeats last command x times
- Disk Operating System (works just like ROM DOS)
- · Easy communication with BASIC/DOS programs
- Two-way communications with PRO-COLOR-FILE ★ Enhanced ★
- Outputs to ASCII Word Processors like Telewriter-64
- Fast 16-Digit Arithmetic with Scientific Functions
- · Summation, Mean, and Standard Deviation Functions
- Logical Functions with String & Numeric Comparison
- String locate command to navigate large worksheets
- Sort full or partial worksheet by columns or rows
- Line, Bar, Hi/Lo/Close, Circle Graphs
- · Full Graphics captioning and overlay facility
- Graphics Drivers for all popular Printers
- Joystick/Mouse Driver for Cursor Movement
- Works with any ROM versions, even JDOS
- 33k Available Worksheet Space
- Up to 256 Columns or 256 Rows
- Can use VisiCalc worksheets & training materials
- On-screen Help Messages

now with GRAPHICS!

Jan Feb Mar Aer May Jun Jul Aus See Oct Nov Dec

FOR 64K DISK SYSTEMS

available from

COMPUTER SYSTEMS CENTER

NEW ADDRESS

42 Four Seasons Center #122 Chesterfield, MO 63017 (314) 576-5020



NOW

ONLY

\$**99**95

10 to 6 Mon.-Fri.

CANADA- CDN \$129.95

CERTIFICATION

SFAL

RGS MICRO INC.
759, VICTORIA SQUARE 405
MONTREAL H2Y 2J3
TEL.: (514) 287-1563
ORDER LINE ONLY * * *
QUEBEC-ONTARIO-MARITIMES
800-361-5338
WESTERN CANADA 800-361-5155



or your local DYNACALC dealer
Price US\$99.95
Outside North America add \$10 postage

DYNACALC Reg. U. S. Pat. Off.
PRO-COLOR-FILE is a trademark of Derringer Software
Telewriter-64 is a trademark of Cognitec
VisiCalc is a trademark of VisiCorp.

(B1\$) 14500 PRINT"SOC.SEC. TOTAL": INPU TB1#: IFB1#=""THEN14600ELSETS=VAL (R1s) 14600 PRINT"FED. INC. TOTAL": INPUT B1\$: IFB1\$=""THEN14700ELSETF=VAL(B1\$) 14700 GOTO13200 14800 14900 ' EDIT YEAR-TO-DATE TO TALS 15000 15100 CLS:PRINTFP#;TAB(4)"EDIT Y EAR-TO-DATE TOTALS": PRINTFP\$ 15200 PRINT:PRINT"PAYROLL TOTAL" :INPUTB1#:IFB1#=""THEN15300ELSEP Y=VAL (B1\$) 15300 PRINT"SOC.SEC. TOTAL": INPU TB1#: IFB1#=""THEN15400ELSEYS=VAL 15400 PRINT"FED.INC.TOTAL": INPUT B1#: IFB1#=""THEN15500ELSEYF=VAL(B1 \$) 15500 PRINT"CONTRIBUTIONS": INPUT B1#: IFB1#=""THEN15600ELSEYC=VAL(15600 PRINT"INSURANCE TOTAL": INP UTB1#: IFB1#=""THEN15700ELSEIY=VA

ENHANCED, EPROM-ABLE DISK BASIC

Now, you can supercharge Basic with an impressive array of extra features WITHOUT sacrificing compatibility! ADOS is compatible with virtually 100% of commercial software. Customizing utilities are provided to allow user-defined commercial software. Customizing utilities are provided to allow user-defined command abbreviations, baud rate, step rate, tracks per disk (35 or 40), support of double-sided drives, and more. After customizing ADOS, you can have it burned into an EPROM that plugs into the Disk Basic ROM socket, or just use it in RAM as a 64K disk utility. (EPROM + burning will cost about \$20-we provide information concerning how you can have this done.) Features include: repeat and edit of the last direct-mode command • 26 definable control key abbreviations • automatic line-number prompts • DOS command • lowercase command entry (a fine complement to a Lowerkit or PBJ WordPak) . COPY (filename) to (drive number) . AE error override option • RAM command (64K) • RUNM command • text echoing to printer • ML monitor • text file scan • enhanced directory • error trapping • hi-res text utility included (42, 51, or 64 characters per line)

"I could not find any software that would not run under ADOS." The Rainbow, December 1984

"ADOS scores 98 + . For a product as complex as a DOS, that's pretty close to the theoretical limit. Having been burned on software which didn't mesh with Disk Basic
1.1, I was wary at first. Now, I use ADOS with complete confidence."

Color Micro Journal, February 1985

Disk ... \$27.95

THE PEEPER ML PROGRAM TRACER

Monitor machine-language programs AS THEY ARE RUNNING! Peeper actually timeshares with the target program, giving FULL CONTROL as ML programs run.

Switch instantly between watching regular program output and Peeper's trace of registers and stack on screen or printer. Inspect memory in any of 26 display modes. Execution speed can be varied from full speed to the barest crawl, or halted entirely, as programs run. Single-stepping, breakpoints, memory or register examine/change. Relocatable, supports 64K use. (16K required) See February '85 review.

Disk...\$23.95 Tape...\$21.95 Assembler source listing... Add 3.00

FASTAPE THE NEXT BEST THING TO A DISK DRIVE

Fastape allows cassette I/O at 3000 baud-TWICE NORMAL SPEED. It uses the high-speed (POKE 65495,0) mode, and makes it convenient to stay in this mode throughout. Features automatic adjustment of cassette and printer parameters when speed mode is changed. Control-key functions for many Basic commands and for changing speed modes. Compatible with all file types, and can be used with Telewriter-64 and many other tape utilities.

Tape...\$21.95 (16K required) See July '83 review.

11111 N. Kendall Drive. SPECTROSYSTEMS Suite A108 Miami, Florida 33176 (305) 274-3899 CompuServe 72355,407 Please add \$2.00 shipping

```
1 (B1s)
15700 GOTO13200
15800
15900
            EDIT PAY PERIOD TOTA
LS
16000
16100 CLS:PRINTFP#; TAB(5) "EDIT P
AY PERIOD TOTAL": PRINTFP$:
16200 PRINT:PRINT"UNION DUES":IN
PUTB1$: IFB1$=""THEN16300ELSETU=V
AL (B1$)
16300 PRINT"CONTRIBUTIONS": INPUT
B1#: IFB1#=""THEN16400ELSETC=VAL(
R1主)
16400 PRINT"INSURANCE TOTAL": INP
UTB1#: IFB1#=""THEN16500ELSEIT=VA
16500 GOTO13200
16600
            END EDIT FUNCTION
16700
16800
16900 GOSUB5100: PUT#2,RN
17000 CLOSE#2:GOTO6700
17100 END
17200 CLS:PRINTFP$::PRINTTAB(8)"
ONE MOMENT PLEASE": PRINTFP#: RUN"
COMPUTE"
17300 CLS:PRINTFP$::PRINTTAB(8)"
ONE MOMENT PLEASE": PRINTFP#: RUN"
CKWRITER"
17400 CLS:PRINTFP*;:PRINTTAB(8)"
ONE MOMENT PLEASE": PRINTFP#: RUN"
EMPLOYEE"
17500
17600 '
            ERROR ROUTINE
17700
17800 FOR X=1 TO 10:CLS
17900 FOR T=1 TO 50:NEXT T
18000 PRINT@233,"ILLEGAL ENTRY":
SOUND 100,1
18100 FOR Y=1 TO 50: NEXT Y, X: CLS
: RETURN
18200
18300 '
            WARNING ROUTINE
18400
18500 CLS:PRINTFP$:PRINTTAB(12)"
warning": PRINT: PRINT" RESERVING
DISK FILE SPACE WILL
                         DESTROY
ANY PAYROLL RECORDS
ENTLY ON DISK!!":PRINT:PRINTFP$
18600 FORX=1TO20:SOUND100,1:FORY
=1TO20:NEXTY,X
18700 PRINT:PRINT"PRESS (ENTER)
TO RETURN TO MENU"
18800 PRINT"PRESS r <ENTER> TO R
ESERVE SPACE"
18900 E2$=INKEY$:IFE2$=""THEN189
00
```

19000 RETURN



Answer The Challenge Of The Demon's Defiance

By Fred B. Scerbo Rainbow Contributing Editor

Editor's Note: If you have an idea for the "Wishing Well," submit it to Fred c/o THE RAINBOW. Remember, keep your ideas specific, and don't forget that this is BASIC. All programs resulting from your wishes are for your use but remain the property of the author.

he "Wishing Well" is a little over a year old now, and the ideas and wishes keep pouring in at a steady pace. Some are quite good; others are totally off the wall.

The biggest problem I have found in writing this kind of column is trying to come up with material which is useful and interesting to the greatest number of readers and CoCo users. Unfortunately, too many readers have not taken this into consideration when making suggestions. Please do not be offended if I cannot elect to write the one program you need that no one else in

the world could use.

Still, quite often, some wishes will have a thread of an idea which will serve as the stimulus for a full-blown project and program listing. This month's listing is one such example.

Some readers have asked when they would get to see another "Scerbo Color Computer Game." As I gave it some thought, I realized that I had not published a real game since the appearance of *Snail's Revenge* in the Second Anniversary Issue in July of 1983. Seeing that this is now 1985, I came to the conclusion that the "Wishing Well" was in need of a game. (After all, being almost two years between games is stretching it a bit, so I figured the time was ripe for a little fun and games.)

Therefore, if this month's "Wishing Well" looks shorter than usual, don't be surprised. A game does not require the technical detail and background that some other articles have required. Don't worry. You're not getting cheated. Those of you who still don't have RAINBOW ON TAPE will find that this short listing will be easy to type in. Besides, I really believe that the game you have listed here will be equal in speed, color and challenge level to some games you may be paying for.

The Wish

Almost two years ago I purchased the first of my two MC-10 Color Computers. As you are well aware, software for this compact little model was and still remains largely non-existent. I quickly wrote up a number of programs which would fit into 4K and still take advantage of the beauty and color of the Microsoft BASIC which Tandy so wisely put into its computers.

One such program was a mini-arcade game called *Demon's Defiance*. The game was much like the space-bird games available for home arcade games and incorporated some of the features of the color *Breakout*-style games which date back to the early days of *Pong*.

To fit into 4K, the BASIC code I wrote had to be extremely small and efficient. Every single byte had to be efficiently utilized. There was no room for waste. Therefore, *Demon* had almost nothing for a title-card, no skill levels, and had to rely totally on the keyboard and space bar for action since the MC-10 had no provision for a joystick.

The resulting program was delivered to The Programmer's Guild. Unfortunately, the market for MC-10 software appeared to be as big as the market for the MC-10 itself. (Tandy dropped

(Fred Scerbo is a special needs instructor for the North Adams Public Schools. He holds a master's in education and published some of the first software available for the Color Computer through his software firm, Illustrated Memory Banks.)

the MC-10 from its line last year due to poor sales.) So much for *Demon*.

When I decided to offer up a game here in the "Well" in response to your requests for one, the idea came along to revive *Demon* in a new and enhanced form. With a little work, *Demon* became *Demon's Defiance II*. The code is still very efficient but some new features have been added.

First, Demon II can use either the right joystick or the arrow keys and space bar for action. Next, I have included the option for using the high-speed poke to allow for a fast or slow game. Believe me, you are going to be very surprised to see how good and rapid a game we can generate without using Hi-Res graphics.

The Program

A few things should be kept in mind before you try typing in or using this program. First, since it uses the PDKE65495,0 for high speed, keep in mind that some CoCos might not be able to use the poke (especially the older ones or some Color BASIC machines). If your CoCo cannot use the PDKE or if you have only Color BASIC, then delete lines 240, 250, 260 and 270.

Secondly, make sure you save the program before running it. If you do run it first, be sure to POKE65494,0 to slow down the computer before you try to save it or you will lose the whole program.

Next, since the program uses a lot of screen POKEs, be sure to check the accuracy of your typing before running the game. A wrong POKE, and poof goes the program into the twilight zone of a locked-up computer.

Another area of concern should be your accuracy in typing in the DATA statements at the beginning. Some lines have groups of just commas, so do not leave any out. The DATA creates the colorful title card which was missing from the original *Demon*.

You will notice that some lines include lowercase letters in the listing. Be sure to press SHIFT 0 to get the reversed lowercase letters. Shift again to finish typing any uppercase letters. This should be no problem for any of you who are old pros at CoCo programming but might be new to our newer owners.

Finally, those of you with 16K Extended computers may wish to PCLEAR 1 before keying in the listing.

This should free up enough memory

for those of you who need it. (It is always hard for me to tell how these will fit since I do the programming on a 64K machine. A PCLEAR 1 never hurts, but 16K Color BASIC users will not need or be able to use this command.)

The Illusion

There are a few tricks which I used in this program to greatly speed up the action. One trick involves the positioning of the shots you fire up the screen. Rather than draw the shot all the way up the screen and have to reset it after each appearance, I only have the shot appear a few times on the screen. This will give the illusion of it traveling up the screen but does not waste the time and memory of drawing it all the way up the screen. When you see the results, you will be amazed how well this technique works.

Also, rather than check to see if a square is set or not, I have stored that information in a multi-dimensional

"... you are going to be very surprised to see how good and rapid a game we can generate without using Hi-Res graphics."

array. Checking the array is much faster than testing the screen. The speed we pick up is impressive and you will never notice that this is the method we are using.

The Demon bird actually appears to fly by printing two different positions of the bird on top of each other over and over again. This flapping gives the illusion of a flying bird.

Overall, these simple illusions go a long way toward making this game look arcade quality.

Playing the Game

Demon's Defiance II is actually quite easy to play, but tough to master. You control a cannon at the bottom of the screen. A Demon bird hovers over you firing laser bolts at you. You can shoot the bird, but your main goal is to blast out the colorful force shield at the top of the screen.

Unfortunately, the Demon has help. A neutralizer beneath your cannon will destroy you if you fire while the red square is directly below your cannon. You only get five lives to start with.

Clear the screen and you will gain a new life. Your score and lives are recorded at the bottom of the screen.

Sound easy? Well, here is where the skill level comes in. As you blast out the shield, the Demon will rebuild parts of it. Level one does not rebuild the shield but higher levels will at increasing speed. This new feature really makes *Demon II* a lot of fun and rather difficult to completely master. When the game has ended, pressing ENTER will rerun the program.

In time, I expect to see some of you listing your high scores in THE RAINBOW Scoreboard.

Is this efficient BASIC code? Well, the actual game lines only take up about 60 short lines. By the efficient placing of IF/THEN statements, the program runs in a relatively straight line with little looping or messy, misplaced subroutines.

Another way in which I kept the speed fast was by not making this listing work on an MC-10 as some of my other recent Color BASIC programs have. As you may recall, in those I included a variable MC which was equal to the offset value for the screen pokes on the MC-10. If I had included this value, the program would really have slowed down and taken up much more memory.

Besides, it would never still fit in 4K as the original *Demon* did. Therefore, those of you with MC-10s will have to try to track down a copy of the original *Demon* if you really want it. (My guess is that very few CoCo programmers have *only* an MC-10. Odds are, if you have RAINBOW, you have a regular CoCo as well.)

Conclusion

There you have it: a small, efficient, rapid, colorful CoCo game. I tried translating this to the VIC-20 just to see how it would work and let me tell you, I gave up after a week. Many of you don't realize how lucky you are to have such an easy-to-use language in the CoCo. The Commodore language is an absolute nightmare when it comes to screen positioning of character codes.

Now that I have gotten my feet wet into game programming again, you may see a few more brand new games popping up in upcoming months. I might even create *Snail III* or *Snail: The Final Chapter* for an upcoming issue like the anniversary issue. Some

of you might want to suggest some game concepts or ideas in your wishes.

Somewhere inside me, I do have a graphics Adventure floating around, but I am waiting for just the right stimulus to come along so I can make it an absolute killer. (Wait! Maybe a game with killer bees would work, or a Michael Jackson takeoff game or . . . see how easy it is to get started?) Only time will tell.

Oops! Some Corrections

I have taken great care in trying to keep the "Wishing Well" free from errors, but as can be expected, some quirks have worked their way into the mechanism.

For example, some copies of the Text Version of the Screen Quiz Programs on RAINBOW ON TAPE ended up with the word NEXT included in every single DATA line. I don't know how it got there. It is not on the paper list, but somehow it crawled onto the RAINBOW ON TAPE. If you have such a copy, just edit out the word NEXT in each DATA line at the end.

Another reader wrote to point out that the check sum values do not work on some listings if you are using them (you know, those funny numbers at the top of the list). Since I write these programs using a full screen editor, sometimes a few blank spaces get included at the end of the line. This totally throws off the check sum values. I have tried to solve this by using the regular EDIT command to reedit the end of each line after the program is finished so that this does not occur again. Sorry!

Finally, a few readers had problems with the *CoCo Tournament Programs* from a few months ago. There are not any real errors in the listing. The errors some of you have gotten have come from not understanding fully how to use the logic of the program, which is probably my fault anyway.

For example, in an eight-man bracket, some of you found the computer would lock up if you included eight names and only ranked the first seven.

If you stop to think about it, you are asking the computer to solve a problem which it cannot do with the formula I have written. Logically, if you have ranked seven of eight players, you have, in fact, ranked the remaining player in position eight. Therefore, this problem is avoided if you only rank six, or rank all eight in the DATA line. The

same goes with 15 out of 16, just rank all 16.

Also, you cannot rank zero players. You must rank at least the first or you will get an OD Error. Again, this is the way the logic in the formula has to be written or else we would have to include quite a few IF/THEN statements.

Finally, when you are doing the ranking of all eight, or all 16, you should include the following line:

For eight bracket:

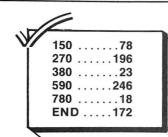
194 IF NW=8 THEN FOR I=1TONW: PR\$(I)=PL\$(I):NEXT:GOTO274

For sixteen bracket:

194 IF NW=16 THEN FOR I=1TONW: PR\$(I)=PL\$(I):NEXT:GOTO278

Somehow, these lines got left out of the listings. This should clear up any problems some of you may have with the programs.

Again, thanks for pointing these out. The instances in which these errors would occur just never came up because of the way in which I was using the program.



The listing:

The morning.
10 REM***********
20 REM* DEMON'S DEFIANCE II *
30 REM* BY FRED B. SCERBO *
40 REM* 149 BARBOUR ST. *
50 REM* NORTH ADAMS, MA 01247 *
60 REM* COPYRIGHT (C) 1984 *
7Ø REM***************
80 CLS0:FORI=1056T01247:READ A:I
FA=ØTHENA=128
90 POKEI,A:NEXTI
100 PRINT@238,CHR\$(221)CHR\$(222)
CHR\$(221)CHR\$(222);
110 PRINT@270,CHR\$(215)CHR\$(219)
CHR\$(215)CHR\$(219);
120 DATA,255,252,251,,255,252,25
2,,255,242,241,255,,255,252,255,
,255,251,240,255,,,253,,,255,252
,252,,
130 DATA,255,240,255,,255,252,25

2,,255,244,248,255,,255,240,255,

,255,244,251,255,,,,,252,252,25 140 DATA, 252, 252, 248, , 252, 252, 25 2,,252,240,240,252,,252,252,252, ,252,240,244,252,,,,,252,252,25 150 DATA175,172,171,,175,172,172 ,,175,172,172,,164,175,168,,167, 172,171,,175,171,160,175,,175,17 2,172,,175,172,172 160 DATA175,160,175,,175,172,172 ,,175,172,172,,160,175,160,,175, 172,175,,175,164,171,175,,175,16 0,160,,175,172,172 170 DATA172,172,168,,172,172,172 ,,172,160,160,,164,172,168,,172, 160,172,,172,160,164,172,,172,17 2,172,,172,172,172 180 CLEAR80: U\$=CHR\$(128) 190 PRINT@328,"by"U\$"fred"U\$"b"U \$"scerbo";:POKE1354,32:POKE1359, 32: POKE1361,46 200 PRINT@359,"copyright"U\$U\$"c" ;:POKE1392,32:POKE1393,40:POKE13 95,41:POKE1396,32:POKE1397,49:PO KE1398,57:POKE1399,56:POKE1400,5 2 210 PRINT@389,"j"U\$"oystick"U\$"o r"U\$U\$"k"U\$"eyboard";:POKE1412,4

0:POKE1414,41:POKE1422,32:POKE14 25,32:POKE1426,40:POKE1428,41 220 X\$=INKEY\$:IFX\$=""THEN220 230 IFX\$="J"THEN JS=1 ELSEIFX\$=" K"THEN JS=0 ELSE220 240 PRINT@425, "f"U\$"ast"U\$"or"U\$ U\$"s"U\$"low";:POKE1448,40:POKE14 50,41:POKE1454,32:POKE1457,32:PO KE1458,40:POKE1460,41 250 X\$=INKEY\$:IFX\$="F"THEN260ELS EIFX\$="S"THEN270ELSE250 260 POKE65495,0:GOTO280 270 POKE65494,0 280 PRINT@452, "select"U\$ "skill"U \$"level";:POKE1482,32:POKE1488,3 2: POKE1494,32: POKE1495,40: POKE14 96,49:POKE1497,45:POKE1498,57:PO KE1499,41 290 X\$=INKEY\$:IFX\$=""THEN290 300 SL=VAL(X\$):IFSL<1THEN290ELSE IFSL>9THEN290 310 WL=109-(SL*8) 320 DIM T(14,4):CLS0:U=1:G=12:Y= 13:B\$=U\$:PD=4 330 KA\$=CHR\$(152)+CHR\$(146)+CHR\$(152): KB\$ = CHR\$ (146) + CHR\$ (148) + CHR\$(148):KC\$=CHR\$(145)+CHR\$(145)+ CHR\$(148)

340 UB\$=B\$+CHR\$(230)+CHR\$(236)+CHR\$(226)+CHR\$(225)+CHR\$(236)+CHR(233) + B: UL = B + CHR ((244) + CHR) (248) + B\$350 DB\$=B\$+CHR\$(228)+CHR\$(227)+B \$+B\$+CHR\$(227)+CHR\$(232)+B\$:DL\$= B\$+CHR\$(249)+CHR\$(246)+B\$:GOSUB3 60:GOTO390 360 QW = 0 : FORI = 1TO14 : FORY = 1TO4 : TI,Y)=0:NEXTY,I:FORI=2TO29:PRINT@I, CHR\$ (159); 370 PRINT@I+32, CHR\$ (207);:PRINT@ I+64, CHR\$(223);:PRINT@I+96, CHR\$(175);:NEXTI:PD=PD+1:POKE1530,PD+ 380 FORI=128TO256:PRINT@I,B\$;:NE XT: RETURN 390 FORWW=418TO445: PRINT@WW, CHR\$ (252);:NEXTWW:PRINTCHR\$(248);:PR INT@482, "score"; : PRINT@500, "live 400 G=B\$+B\$+CHR\$(215)+CHR\$(213)+CHR\$(210)+B\$+B\$410 PRINT@384+G,G\$; 420 IFQW=>112THENGOSUB360 430 W=RND(6):IFW>3THEN450 440 Y = Y + 1 : GOTO 460

450 Y=Y-1:IFY<=0THENY=0

THE POWER BEHIND THE PRINTED WORD.



460 IFY=>24THENY=24 470 IFS=1THEN530 480 E=RND(6): IFE>5THENS=1 490 RB=RND(100): IFRB<WL THEN520 500 RC=RND(4):RD=RND(14):IF T(RD ,RC) = ØTHEN52Ø 510 SC=5-RC:PRINT@((SC-1)*32+RD* 2), CHR\$(239)CHR\$(239);:T(RD,RC)= 0: QW=QW-2 520 GOSUB530:GOTO540 530 PRINT@192+Y, UB\$; : PRINT@226+Y ,UL\$;:RETURN 540 IFS=0THEN620 550 FORH=64T0192STEP32:PRINT@195 +Y+H, CHR\$ (154) CHR\$ (149); : NEXT: FO RH=64T0192STEP32: PRINT@195+Y+H,B \$B\$;:NEXT:SOUND10,1:S=0 560 IFY+1-G>20RG-Y-1>2THEN620 570 GOSUB580:GOTO620 580 FORJL=1T02:PRINT@320+6,KA\$KB \$;:PRINT@352+G,KB\$KC\$;:PRINT@384 +G,KC\$KA\$::SOUND255,1:PRINT@320+ G, KB\$KC\$;:PRINT@352+G, KC\$KA\$; 590 PRINT@384+G, KA\$KB\$;:SOUND100 .1:NEXTJL:PRINT@320+G.B\$B\$B\$B\$B\$ B\$::PRINT@352+G.B\$B\$B\$B\$B\$B\$::PR INT@384+G.B\$B\$B\$B\$B\$: 600 G=RND(13)*2:PRINT@384+G,G\$;: PD=PD-1:POKE1530,PD+48 610 IFPD<=0THEN890 620 SOUND255,1 630 GOSUB640: GOTO650 640 PRINT@192+Y, DB\$;:PRINT@226+Y ,DL\$;:RETURN 650 F=RND(2): IF F>1THEN670 660 F=RND(13)*2:PRINT@448+U,B\$B\$ B\$::PRINT@448+F,CHR\$(188)CHR\$(18 8) CHR\$ (184); : U=F 670 IFJS=0THEN700 68Ø IFPEEK (339) = 254THEN78Ø 690 JP=JOYSTK(0): IFJP<25THEN740E LSEIFJP>38THEN760ELSE430 700 X\$=INKEY\$:IFX\$=CHR\$(32)THEN7 80 710 IFX = CHR = (9) THEN 760 72Ø IFX\$=CHR\$(8)THEN74Ø 73Ø GOTO43Ø 740 G=G-2: IFG<=0THENG=0 750 GOTO770 760 G=G+2: IFG=>26THENG=26

See You At
RAINBOWfest CHICAGO
May 17-19

770 PRINT@384+G,G\$;:GOTO430

780 IF U-2=G THEN580 790 SOUND30,1:FORH=0T0224STEP64: PRINT@G+355-H,CHR\$(154);:PRINT@G +355-H.B\$:: NEXTH 800 IFG-Y>30RY-G>3THEN830 810 FORO=1TO2:PRINT@192+Y,KA\$KB\$;:PRINT@224+Y,KB\$KC\$;:SOUND1,1:P RINT@192+Y,KC\$KA\$;:PRINT@224+Y,K A\$KB\$::NEXTO 820 PRINT@192+Y,B\$B\$B\$B\$B\$B\$B\$B\$::PRINT@224+Y.B\$B\$B\$B\$B\$B\$B\$:: GS=GS+100: Y=RND (24): GOSUB880: GOT 0420 83Ø LV=1 840 R=(G+2)/2: IFT(R,LV)=1THEN860 850 GOSUB530:QW=QW+2:T(R,LV)=1:P RINT@G+354-(H+32*(LV-1)),B\$B\$;:G OSUB640: GS=GS+(25*LV): GOSUB880: G OT0420 860 LV=LV+1: IFLV>4THEN420 87Ø GOTO84Ø 880 GOSUB530:GS\$=STR\$(GS):P=LEN(GS\$):FORW=1TOP: Z=ASC(MID\$(GS\$,W, 1)):POKE1510+W,Z:NEXTW:GOSUB640: RETURN 890 PRINT@267, "game"+B\$+"over"; 900 IFINKEY = CHR \$ (13) THEN RUN 910 GOTO900

About Your Subscription

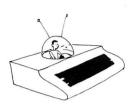
Your copy of THE RAINBOW is sent second class mail. If you do not receive your copy by the 5th of the month of the publication date, send us a card and we will mail another immediately via first class mail.

You must notify us of a new address when you move. Notification should reach us no later than the 15th of the month prior to the month in which you change your address. Sorry, we cannot be responsible for sending another copy when you fail to notify us.

Your mailing label also shows an "account number" and the subscription expiration date. Please indicate this account number when renewing or corresponding with us. It will help us help you better and faster.

For Canadian and other non-U.S. subscribers, there may be a mailing address shown that is different from our editorial office address. Do not send any correspondence to that mailing address. Send it to our editorial offices at P.O. Box 385, Prospect, KY 40059. This applies to everyone except those whose subscriptions are through our distributor in Australia.

EARTH TO ED





There've Been Some Changes Made . . .

By Ed Ellers Rainbow Technical Writer

a bit to fill you in on some recent CoCo developments. First of all, there has been a lot of talk about the Korean CoCo. (Bob Rosen, of Spectrum Projects, suggests it should be called the KoCo!) So far, the CoCos made by TC Electronics Korea have been 16K models only (the model numbers are 26-3134 for non-Extended and 3136 for Extended). A 64K Extended model from Korea (26-3137) is expected in a few months after stocks of the 64Ks made in Fort Worth dwindle.

There are actually two different versions of CoCos made in South Korea for the U.S. market. (A writer from Holland sent me pictures of the Korean CoCo for the European PAL color TV system; it's similar to the first version in the U.S.) The first machines were very much like the American-made CoCo 2s, with a few minor changes and the fact that many of the chips are now soldered in. The RAM chips are arranged somewhat differently, with five on the bottom row of the board (under the keyboard) and the other three on the row above them. Upgrading this version to 64K

is just as easy as on earlier CoCo 2s; you just replace the RAMs with a set of eight 4164 chips and solder across two holes in the board, which are now in a box marked 64K. Incidentally, many suppliers are now selling 64K RAMs in sets of *nine*; these are for the IBM PC and many of the "compatibles" (including the Tandy 1200), which use the ninth bit for a parity checking feature. If you find that you can buy a set of nine from one supplier cheaper than sets of eight from others, there's nothing wrong with buying nine and using eight. (The extra chip might come in handy for repairs later.)

Few computers use the "standard" 4116 16K-by-1 bit RAM chips anymore (the CoCo is the only one still on the U.S. market that I know of). The later CoCo 2s from Korea (the 26-3134A and 3136A) are now using Texas Instruments 4416 RAM chips. These are 16K-by-4 bit chips, so only two are used, instead of the previous eight. These new chips take an addressing scheme different from that of regular chips, so Motorola's new 74LS785 SAM chip is used instead of the 74LS783 (formerly 6883) used with "standard" RAMs. Color BASIC has been patched (again!) to set up the SAM chip for the 4416s; this new version, called Color BASIC 1.3, apparently is otherwise identical to the "new ROM" 1.2 version. Marty Goodman of Cheshire Cat Software disassembled 1.3 and compared it to 1.2, and he tells me that he believes all programs

that work on "new ROM" machines will still work. (Extended BASIC 1.1 was not changed, and Disk BASIC 1.0 and 1.1 still work fine.)

Sadly, for those of us who "do it ourselves," the "A version" Korean CoCos are much more difficult to upgrade than the previous models. First of all, the upgrade to 64K RAM is complicated by the fact that the new machines won't accept 64K-by-4 bit RAMs (the SAM can't address them, and BASIC 1.3 doesn't have the needed code) and there are no sockets for regular 64K chips. There are two 12-pin edge connectors on the board that apparently will take a "piggyback" board for 4164 RAMs, but Tandy doesn't have this available yet. (The upgrades that they are doing are apparently done by putting in an entire main board with regular RAMs; since the old 16K boards can then be used to repair defective 16K machines, this may actually be cheaper for them with the amount of repair and upgrade work Radio Shack does.) Secondly, the two ROM sockets (one for Extended BASIC) have been replaced by a single 28pin socket that takes either a 24-pin Color BASIC ROM or a 28-pin ROM for both Color BASIC and Extended BASIC. (In the 3136A model which is factory-equipped with Extended BASIC, the ROM is soldered in.) To put in Extended BASIC you will have to order a different part, which should be no problem if you are ordering from Tandy's

(Ed Ellers, a RAINBOW and PCM staff member, is a self-confessed electronics fanatic whose other interests include science fiction.) National Parts Department, but may be trouble if you try to get it from a mail-order house (they should have it soon, though). I'm also told by Bob Rosen that this socket can be modified with one wire to take either Tandy's ROM or a 27128 EPROM. There are also a number of jumpers that have to be changed when upgrading to Extended BASIC; these are marked 128K, which refers to the 128K-bit total of a 16K-byte ROM.

There have also been some changes in the CoCo product line. The Multi-Pak Interface (26-3124) has been redesigned to match the size of the CoCo 2, and the first disk drive kit (26-3129) now uses "thinline" drives, meaning you can put two drives in a single case. Finally, the TRS-80 nameplate is going by the boards; all new computer products sold by Radio Shack (and many existing ones, like the CoCo, in a few months) will carry the Tandy name already found on the 200, 1000, 1200 HD and 2000.

Now to the letters.

Video Output for PAL Computers

• As my family and I are proud owners of a CoCo 2 (16K Extended), my problems have started to develop. The Tandy Group in Holland is not very helpful in supplying the information I require, except that after four months one of their representatives mentioned your magazine, which is hard to get in Holland and rather expensive. I hope you are willing to answer some questions, and not only in the magazine, as this will take me a long time to wait.

What type of board do we have?

How do I connect a monitor to the CoCo via video input or, even better, the RGB input?

Wolfgang Beekman Oisterwijk, The Netherlands

From looking at the pictures you sent, it looks like your machine is nearly the same as the first version of the Korean CoCo sold in the U.S. Upgrading it to 64K should pose no problem if you just insert the 4164 RAMs and solder across the 64K jumper as I explained in my commentary above.

Unfortunately, hooking up a monitor may be more difficult. The U.S. CoCo (made for the NTSC system) uses a 6847 video generator and an MC1372 encoder chip together to generate the TV signal. The PAL (Phase Alternation by Line, the system used in most European countries) version also uses these two chips, but also has some added circuitry to generate the PAL phase alternation. Because of this, the commonly available video output modification kits (such as the ones sold by Moreton Bay, Mark Data, Computerware and others) may not provide a proper PAL signal. I've never seen a PAL CoCo, since they aren't sold in this country, so I really don't know. If you want to use a monochrome monitor, one of these kits should do the job, since the monochrome signal goes from the 6847

to the 1372 in the same way and the kits take it off there.

Screen Print Troubles

• I have a problem with Radio Shack's screen print program. I realize that this program was designed for a 16K computer, but I have a 64K machine. I tried upgrading it to 32K with the utility described in the October issue without success.

Bob Conklin Milwaukee, WI

• I'm wondering if other people have had trouble using Radio Shack's Hi-Res Screen Print Utilities with the CGP-220 Ink-Jet Printer. A Radio Shack salesman has been unable to give me any help, despite making several phone calls.

Richard Volans Ogdensburg, NY

I'm going on the assumption that Radio Shack's current screen print driver (BWDUMP on one side, CODUMP on the other) is being used. To use either of these programs in a 32K or 64K machine, you first CLEAR 200,31232 and then CLDADM ''program'',16384:EXEC. The value 16384 tells the CoCo that the program should be loaded 16384 bytes (exactly 16K) higher than the addresses in the file. The EXEC address is corrected automatically.

On the color dump program, the printer should be set to 2400 Baud using the switch on the back (see the CGP-220 manual for details). CODUMP sets the CoCo to 2400 Baud automatically. If you have a serial-to-parallel interface, you can run at speeds as high as 9600 Baud, but you will need to poke in the appropriate value after executing CODUMP. (The CGP-220 doesn't have a switch to select parallel or serial input; just plug into one connector or the other and disconnect whatever was plugged into the other jack.)

The Multilingual CoCo

• I will be attenaing college soon, and am in need of programs that will assist me in the data processing field. The languages studied will be COBOL and PASCAL. I would appreciate any information on this subject. James Allen Hall

Tames Allen Hall Castlewood, VA

There are several PASCAL compiler packages on the market for the CoCo; one that comes to mind is *DEFT Pascal* from DEFT Systems. COBOL will be more difficult; I've heard that there are COBOL compilers available for OS-9 based systems, but I don't know who sells them or even if they will run on OS-9 Level I (which is the version used on the CoCo). From looking at packages for other systems (MS-DOS,

UNIX, CP/M, etc.) I'd say that a COBOL compiler would also be very expensive.

Deluxe, Advanced, Super-Duper, New and Improved . . .

• I have just purchased a 64K CoCo 2 and I've noticed some interesting things in the new Getting Started With Extended Color BASIC manual. On pages 199 and 200 there are notes in the margin to "Deluxe Color Computer" and "Advanced Color BASIC." In the text, it mentions that on the Deluxe CoCo we should use the "CTRL key" instead of the up-arrow in some situations. Did I just buy a new computer that is going to be replaced?

Eugene J. Resch Alexandria, VA

I've seen some of these references, though I hadn't heard of Advanced Color BASIC. Rumors about a Deluxe CoCo (a.k.a. CoCo 3), with such goodies as 128K RAM, true lowercase and a parallel printer port have been floating around for over a year now. The best that I've been able to make of it is that Radio Shack was planning to introduce the Deluxe CoCo (hence the notes in the manual) but dropped it at the last minute. I don't see any indication that the CoCo 2 will be dropped, however.

More BASIC Differences

• I own a SpectraVideo SV-328, and its BASIC appears to be very similar to that of the CoCo. My machine uses Microsoft BASIC, with the main added commands being PLAY, SOUND, BEEP, PSET, PRESET and DRAW. These commands make the listings look very similar. Do you know where I could get a list of CoCo commands and explanations on how they work?

Todd Davies Donnybrook, West Australia

The best things to look at are Radio Shack's own Color BASIC and Extended Color BASIC manuals, which are available at any Radio Shack store (Tandy Electronics stores overseas). Microsoft, which wrote the BASIC interpreters for the CoCo, the SpectraVideo machines and most other microcomputers, generally puts the same BASIC syntax in each, though which actual commands are there depends on what the manufacturer wants for his product, how much memory is available and what sort of video display, sound, joystick and other circuitry is available. I suspect that most CoCo programs, which have gotten very sophisticated, will have to be reworked extensively to run on your computer. (You might also look into some of the British magazines, which are now carrying listings for the MSX computers; MSX magazine, published in Japan, carries listings as well, though the articles are in Japanese.)

83

COLOR TERM + Plus +

Select:

Half, Full Duplex or Echo

Odd, Even, Mark, Space or No Parity

7 or 8 Bit Words

1 or 2 Stop Bits

All Caps if needed

Several Printer Formats

Trapping of incoming characters

BAUD Rates:

110-4800 (communicate)

600-9600 (printer)

Screen Format:

32 x 16, 42, 51, 64 or 85 x 24

Send all 128 characters from keyboard

Buffer:

Merge text or programs

49K to 53K memory

Four Buffer Send Modes

Display Bytes Used/Remaining

Editor-Move forward and reverse thru buffer. Insert, type over, delete lines,

characters or words. Block delete.

10 Macro keys

Automatic Capture of incoming files

X on / X off capabilities

Send True Line Break

Transmit/Receive BASIC Programs, Files or Machine Code. No need to translate

BASIC programs to ASCII Format.

Save/Load Macros or Parameters to Disk

Use 1 to 4 Disk Drives (w/SAVE, LOAD, DIR & Granule Display)

Print while receiving information*

Easy to use MENU driven format

Comprehensive users manual

Works on All Radio Shack Color Computers, and All Radio Shack Disk systems.

PRICE: Color Term + \$49.95 (Disk/Tape)

GALACTIC MATH ... Addition and multiplication drill (saucer game) for ages 6 to 10.

16K ext. \$15.95



DOUBLE DOS II

Double DOS II — Now use 35,40,or 80 track (double or single sided) drives, all on one system, all at the same time. All regular disk commands are supported with Double DOS II and are totally transparent to your BASIC programs! You can get up to 158 granules on a disk using an 80 track drive. These are the added commands:

BAUD 1-6...change the BAUD rate.

TRACK 35,36,40,80...change number of tracks.

DOUBLE... enable the double sided option.

PDIR ... print your directory to printer.

DUMP ON/OFF...send programs without a terminal program.

RATE 6,35 ... change the head stepping rate.

VIDEO ON/OFF...reverse video without a hardware mod.

SCROLL 1-255...change your screen scrolling speed.

COMMAND ... will list all new commands.

DUPE 0,1,2... will allow copy & backup from one side of a drive to another!

DATE... you can enter the month, day and year as an extension to your programs

when they are displayed during a DIR command.

We guarantee that this program will work using the above commands, with all types of 35, 40 or 80 track drives!

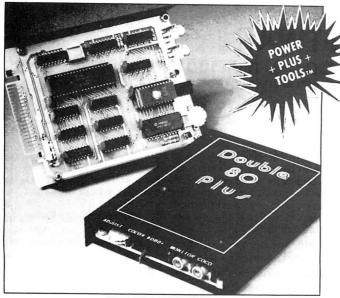
PRICE: \$29.95 (DISK ONLY) 64K required

Double Density Software

620 Kings Row • Denton, Texas 76201 • 817-566-2004

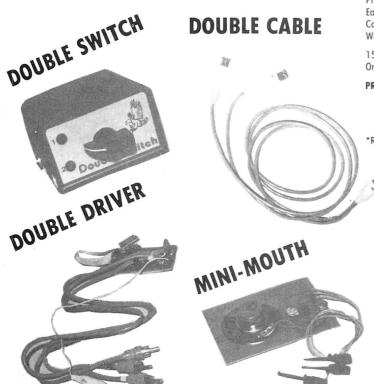






HARDWARE

DOUBLE SWITCH — Two LEDs show you which port is being used, 1 or 2. High Quality parts with a great looking face plate!	
DOUBLE CABLE — Hook a MODEM and a PRINTER up at the same time with this Y-connector	
EXT-CABLE — long printer or MODEM cable (15 feet)	
Y-CABLE — You can connect two devices at the same time to your ROM port (80 column card and disk Drive)	
DOUBLE DRIVER — Best video driver available for your CoCo. Made by our friends at Moreton Bay Software. Specify CoCo or CoCo II	
MINI MOUTH — Now get sound from your mute monitor. Plugs right in, nothing to solder\$24.95	
$ \begin{array}{llllllllllllllllllllllllllllllllllll$	
$\label{eq:mini-modem} \textbf{MINI-MODEM} = 300 \text{ BAUD, Originate/Answer Full Duplex, Direct Connect} .\$79.95 \\ \text{(Save $10.00 when you buy one of our terminal programs and a modem)}$	
DISKS — DISKS — DISKS — DISKS — DISKS Save on blank 51/4" diskettes. Buy in bulk and save! No sleeves. (10 minimum in each order)	



DOUBLE TERM + Plus +

This program is the **ultimate** in CoCo communicating!Double Term + is used with a plug-in 80 column board. Supports either Double 80 Plus, Color Power II or Word Pak.

Here are just some of the features Double Term + has to offer:

Select:

Half, Full Duplex or Echo

Odd, Even, Mark, Space or No Parity

7 or 8 Bit Words

1 or 2 Stop Bits

All Caps if needed

Several Printer Formats

Trapping of incoming characters

BAUD Rates:

110-4800 (communicate)

600-9600 (printer)

Screen Format:

80 x 24 upper/lowercase

Send all 128 characters from keyboard

Buffer:

Merge text or programs

49K to 53K memory

Four Buffer Send Modes

Display Bytes Used/Remaining

Editor—Move forward and reverse thru buffer. Insert, type over, delete lines, characters or words. Block delete.

10 Macro keys

Automatic Capture of incoming files

X on/X off capabilities

Send True Line Break

Transmit/Receive BASIC Programs, Files or Machine Code. No need to translate BASIC programs to ASCII Format.

Save/Load Macros or Parameters to Disk

Use 1 to 4 Disk Drives (w/SAVE, LOAD, DIR & Granule Display)

Print while receiving information*

Easy to use MENU driven format

Comprehensive users manual

Works on All Radio Shack Color Computers, and All Radio Shack Disk systems.

15-day money back guarantee (less a \$10.00 restocking/use charge.)
Only \$5.00 each for all future upgrades when you return your warranty card.

PRICE:	Double Term +
	Y-Cable
	Double 80 Plus
	Complete Package

^{*}Requires PC Pak from PBJ, Inc.

DOUBLE 80 PLUS

TRUE 80 COLUMN OUTPUT
BUILT IN SWITCH FOR COCO OR DOUBLE 80 PLUS
ADJUSTABLE VIDEO OUTPUT
GOLD PLATED EDGE CONNECTOR
DRIVERS AVAILABLE FOR BASIC, OS9 and FLEX
DISPLAY ALL ASCII CHARACTERS
ALTERNATE CHARACTER SETS AVAILABLE
METAL CASE (not cheap plastic)
DOUBLE TERM + available for this board
BACKED BY A 90 DAY PARTS AND LABOR WARRANTY
DOUBLE 80 PLUS (80 column board) ...\$99.95
Y-CABLE ...29.95
BASIC DRIVER ...12.95

 OS9 DRIVER
 12.95

 FLEX DRIVER (available soon)
 12.95

 DOUBLE TERM + (disk only)
 55.95

PRICKLY-PEAR SOFTWARE

QUALITY PROGRAMS FOR YOUR COCO & TDP-100

PROGRAMS REQUIRE 16K EXTENDED BASIC FOR TAPE, AND 32K DISK UNLESS OTHERWISE NOTED.





TO PRESERVE QUANDIC - NEW!!!

It has been a long time since we were really excited about an adventure game. Adventure In Wonderland was and is the best text adventure ever written for the Color Computer. We said so, and reviewers agreed!

We are now proud to offer **TO PRESERVE QUANDIC.** We believe that this is the best GRAPHICS adventure ever written for the Color Computer.

Although it works just fine on a one drive system, the game COMPLETELY FILLS two disks. Over 300K of programming. It is four times as big as any adventure you have seen on the Color Computer.

Quite simply, TO PRESERVE QUANDIC sets a new standard for adventure games on the Color Computer.

The game itself is a work of art in every way. The puzzles are fun and challenging, you can use complete sentences, abbreviations, short phrases, and there are several milestones on the way to success. The whole game is done in full color highest-resolution graphics. Of course you can save the game in progress.

TO PRESERVE QUANDIC, you must find and return the missing piece of the time machine, and the clock is running... If you think you are ready for the best graphics adventure ever written for the Color Computer, don't miss TO PRESERVE QUANDIC. Packaged on two disks in a quality vinyl library case. Requires 32K and 1 disk drive. If you don't have a disk drive, it will be worth buying one just for this game. \$39.95

ALL TIME FAVORITES

Adventure in Wonderland — Rainbow magazine reviewers agreed this was the best adventure ever written for the color computer. It incorporates an artificial intelligence and has a vocabulary of over 500 words. Don't miss this one. Req. 32K tape — \$24.95; Disk — \$29.95

Super Astrology — This program calculates complete natal horoscopes to an accuracy of aboaut one minute of arc. All you need to know is the time and place of birth. Req. 32K Tape — \$24.95; Disk — \$29.95

FUN AND GAMES

Color Disk Trivia — Our trivia program has 1100 questions in 5 catagories. Play alone or with up to 4 players. Use the development system included to write your own question disk game and development disk — \$29.95. Four different question disks are available for use with the Color Disk Trivia game.

Bible Questions - \$19.95

Sports Questions - \$19.95

Entertainment Questions - \$19.95

Childrens' Questions - \$19.95

Order any of these additional question disks with the Color Disk Trivia game and pay only **\$14.95** each.

Gangbusters — Try your hand at running a criminal empire. 2-6 players - requires 16K. Tape - **\$24.95**; Disk - **\$29.95**

Viking II — See if you have what it takes to become King or Queen. For 1-4 players, save the game feature, requires 32K. For 16k users try the original Viking. Tape - \$24.95; Disk - \$29.95

Monsters & Magic — This fantasy text simulation is a combat oriented game for fantasy gamers. It contains 50 different monsters to fight, a dungeon with over 1000 different place descriptions and lots of surprises. Tape - \$24.95; Disk - \$29.95

Compleat Enchanter — A 100% GRAPHICS adventure with tons of rooms, lots of options and magic. 32K req. Tape - \$24.95; Disk - \$29.95

STATISTICS

Lizpac — Absolute the most complete statistics package we have seen for ANY computer anywhere. Lizpack is 850,000 Bytes of programming filling 7 disks with an eighth disk containing data files to be used in the examples. The 200 page manual completely explains all that Lizpac has to offer. It is user friendly. Req. 32K disk only. \$195.00

FLIGHT PLANS

Airnav — This professional flight planner is powerful and user-friendly, too. Developed by a Commercial Airline Pilot this program takes only two minutes to produce a complete flight pan plan on your screen or printer. This program package is for disk system only (32K) and is shipped with complete instructions in a quality binder. If you fly, you need AIRNAV. \$99.95

1-800-223-5369 EXTENSION 256

Send for our free Catalog of great Programs for your CoCo

POLICY ON PROTECTION

We believe our customers are honest — all of our software can be backed up using standard backup procedures.

Your Personal check is welcome - no delay. Include \$1.50 shipping for each program ordered. (Shipping free on \$50.00 or larger orders). AZ residents add 7% sales tax. Orders shipped within two days.

Dealer and author inquiries are always welcome. Canadian dealers should contact Kelly Software Distributors, Ltd., P.O. Box 11932, Edmonton, Alberta T5J-3L1 (403) 421-8003

Stocked by Quality Dealers, or

Send Order To: PRICKLY-PEAR SOFTWARE



2640 N. Conestoga Ave. Tucson, Arizona 85749 (602) 749-2864





Home Financial Statement

. . . Forming habits beneficial to your financial health

By Roland B. Portillo

don't know how it is in your family, but these days it seems that no matter how careful we are with our money, there never seems to be enough at the end of the month. I always wondered where it all was going.

As a result, I knew that this would be a perfect job for a great record-keeper, my Color Computer. So, I wrote a program that would not only show how much money was going to individual expenses each month, but that would accumulate expenses for the year-to-date, as well as express every expense as a percentage of gross income.

This would be a great help at tax time, too. By forcing myself to keep a daily record of expenses, and keeping all the receipts, I have a pretty good idea what I spent, for instance, on items on which sales tax was paid. By making simple calculations, maybe I could beat the sales tax tables (which always seem too low!).

If you are really serious about keeping track of your finances, you must keep a detailed record of what you

(Roland Portillo is an auditor with 14 years experience and has had his Color Computer for two years. His primary interest is programming for home money management.)

spend and what you spend it on. I keep a clipboard on my desk, where every day I write down this information as soon as I walk in the door. You may want to keep a small tablet handy to make notes throughout the day. I admit, it's somewhat of a nuisance, but it quickly becomes habit. At least, this is a habit that could be beneficial to your financial health.

About the Program

The program uses a little over 8.5K, so it will work on a 16K Extended BASIC machine. It's designed for one disk, but

can be adapted to work on a cassettebased machine with not too much effort.

As is the case with most financial type programs, this one also requires a printer. In this instance, the printer codes are for an Epson MX-80.

Epson Printer Codes:

The printer codes in lines 640, 850, 930, 940, and 950 may vary for your printer. For an Epson they are as follows:

CHR\$(14) - Double Width Letters

For M	Income Sta Month Ending		nent	
Sources of Income	Month	Percent	Y.T.D	Percent
Husband's salary	2,554.36	48.5	31,896.10	48.7
Wife's salary	2,049.60	39.0	27,121.80	41.4
Overtime	413.12	7.9	3,780.15	5.8
Interest earned	242.55	4.6	2,573.08	3.9
Miscellaneous income	2.25	0.0	94.32	0.1
Total	5,261.88	100.0	65,465.45	100.0
Withholding and Payments				
F.I.C.A.	165.01	3.1	2,070.94	3.2

CHR\$(12) - Form Feed
CHR\$(15) - Turns on Condensed
Letters
CHR\$(18) - Turns off Condensed

CHR\$(18) - Turns off Condensed Letters

Definition of Variables:

01A\$ - Account and heading names
 M - Monthly dollar amounts
 MM - Monthly percent of each item
 Y - Year-to-date amounts
 YY - Year-to-date percent

Operation of the Program

The program is user-friendly. Just follow the instructions on the screen.

When using this program for the first time, you are asked if there are any cumulative year-to-date totals that need to be entered. Answering "None" will take you to the start of the data input routines.

Accounts

All the account names and group headings are in the data statements starting at Line 1040. Changes can be made easily to customize these items to meet your specific needs. One word

	Mary Mary Control of the State			
Federal income taxes	411.34	7.8	8,459.75	12.9
State income taxes	154.55	2.9	2,820.07	4.3
Retirement and				
deferred compensation	100.39	1.9	5,647.00	8.6
I.R.A.	0.00	0.0	2,566.35	3.9
Credit union loans	330.00	6.3	1,989.82	3.0
Total	1,161.29	22.1	23,553,93	36.0
Residential Expenses				
Mortgage payments	546.00	10.4	6,552.00	10.0
Property taxes	0.00	0.0	0.00	0.0
Insurance	0.00	0.0	524.10	0.8
Repairs and maintenance	86.45	1.6	1,267.89	1.9
Utilities:				
Telephone	50.79	1.0	347.82	0.5
Electricity	20.87	0.4	311.03	0.5
Gas	27.10	0.5	211.91	0.3
Water and disposal	22.71	0.4	154.29	0.2
Major improvements	40.46	0.8	335.97	0.5
Furnishing purchases	152.96	2.9	305.92	0.5
Total	947.34	18.0	10,010.93	15.3
Automobile Expenses				
Husband's car:				
Insurance	154.10	2.9	568.76	0.9
Repairs and maintenance	0.00	0.0	179.45	0.3

One-Liner Contest Winner . . .

In this space game, you maneuver your ship through an asteroid field to reach the base. If you hit an asteroid it turns blue; the goal is not to hit any.

The listing:

Ø CLSØ:FORX=1TO125:SET(RND(63),R
ND(31),5):NEXT:FORX=1TO4:READA,B
:PRINT@A,CHR\$(B);:NEXT:DATA411,1
79,442,191,443,188,444,191:FORX=
1TO10000:RESET(H,V):H=JOYSTK(0):
V=JOYSTK(1):IFV>31THENV=31:SET(H,V,3):NEXT:ELSESET(H,V,3):SOUNDH+1,1:NEXT:PRINT"GAME OVER"

Garry Shelton Kannapolis, NC

(For this winning one-liner contest entry, the author has been sent copies of both *The Rainbow Book Of Simulations* and its companion *Rainbow Simulations Tape*.)

One-Liner Contest Winner . . .

Music Box is exactly that, a program that plays a single tune. The author decided that somebody had to write a music program to go with all those beautiful graphics!

The listing:

5 A\$="02L2CEGE03C02GEG":B\$="03L1 .CL2ECEGE04C03BAL1.GP4L2GFD02BGB 03D":C\$="04L2C03AFC02A03CFAGCAL1 .GP4L2GFD02BGB03D":PLAY"T11XA\$;X A\$;XB\$;FECAL1.GP4XB\$;02B03C02G03 EL1.CP4XC\$;FECAL1.GP4XC\$;02B03L1 ..CP4":GOT05

> Bob Leiter North Platte, NE

(For this winning one-liner contest entry, the author has been sent copies of both *The Rainbow Book Of Simulations* and its companion *Rainbow Simulations Tape*.)

of caution here. If you do change the account names, be sure to keep the same number of accounts in each grouping, or the totals and percentages will be off.

A note about the sales tax calculation. In my state the rate is 6.5 percent. You will need to change Line 460 for your particular circumstances.

For quick reference to the numerous accounts, after typing in the program, run it up to where it says ENTER STATEMENT DATE: At that point, hit the BREAK key, turn your printer on, and type in the following direct command:

FOR N=1 TO 71:PRINT#-2,N;A\$(N):NEXT

Pressing ENTER will send the various account names with their corresponding numbers to the printer which will be verified when you enter your data into the program. You can then either type CONT or run the program from the beginning.

After all your data has been entered, you can enter SUM to see a summary of your figures, just to be certain that you haven't forgotten anything. When the screen freezes, hitting any key will always continue the program. If you are satisfied that all your data is accurate, simply type END.

You will be asked if these are the final figures for the month or whether more will be added at a later date. If you answer "No" to any additions, the program will calculate the data. Once again, before the statement is printed you can request a preview, to quickly see the final results on the screen.

A check will then be made to see if the printer is ready. If not, you will be asked to put it online before continuing the program.

A note about the printer check. If you keep your printer unplugged for any reason (mainly to use the outlet), then the routine will be effective. I use a power strip with an on/off switch, so if I forget to turn the power on to the printer, my data won't be sent to nowhere. Of course, if this should happen, simply hit the BREAK key, turn your printer on, type in GOTO 600, and press ENTER. This will take the program back to the beginning of the print routine without a loss of your data.

I hope you find a use for this program. I consider it to be one of my most useful. Hopefully, by finding where I'm spending too much money, I can save enough to buy more computer equipment.

Licenses and fines	0.00	0.0	68.00	0.1
Gasoline	67.51	1.3	665.88	1.0
Less reimbursements	0.00	0.0	-777.60	-1.2
Total	221.61	4.2	704.49	1.1
Automobile Expenses				
Wife's car:				
Insurance	0.00	0.0	163.38	0.2
Repairs and maintenance	62.20	1.2	570.73	0.9
Licenses and fines	12.00	0.2	54.00	0.1
Gasoline	99.20	1.9	1,252.64	1.9
Less reimbursements	-199.10	-3.8	-1,332.59	-2.0
Total	-25.70	-0.5	708.16	1.1
Total				
Automobile				
Expenses	195.91	3.7	1,412.65	2.2
Other Expenses				
Jnion dues	8.10	0.2	97.20	0.1
Life insurance	89.72	1.7	889.52	1.4
Health/Hospital insurance	26.26	0.5	188.51	0.3
Medical/Dental	9.25	0.2	418.46	0.6
Pet expenses	104.02	2.0	972.56	1.5
Meals out	209.02	4.0	2,585.35	3.9
Food purchases	78.79	1.5	1,775.29	2.7
Appliances, dishes, etc.	1.04	0.0	282.45	0.4
Small tools, etc.	4.22	0.1	306.22	0.5
Work related expenses	134.56	2.6	479.47	0.7
Computer expenses	82.27	1.6	809.16	1.2
Stereo/video/photo	-0.87	-0.0	3,324.22	5.1
Hobby expenses	0.00	0.0	98.11	0.1
Entertainment	102.50	1.9	550.92	0.8
Physical fitness expenses	26.71	0.5	1,001.14	1.5
Personal grooming and hygie	ne 43.98	0.8	674.97	1.0
Vacation	35.29	0.7	480.16	0.7
Clothing	373.27	7.1	2,324.52	3.6
Laundry and cleaning	0.00	0.0	29.46	0.0
Gifts, etc.	91.28	1.7	851.51	1.3
Flowers	0.00	0.0	30.31	0.0
Contributions	17.00	0.3	243.81	0.4
Magazines and books	0.00	0.0	97.07	0.1
Bank/finance charges	0.00	0.0	70.56	0.1
Collectibles	145.35	2.8	1,002.16	1.5
Miscellaneous	47.08	0.9	400.10	0.6
Total	1,628.84	31.0	19,983.21	30.5
Total Expenses	3,933.38	74.8	54,960.72	84.0
Change in Savings	1,328.50	25.2	10,504.73	16.0

160	9	960 219
310	. 135	1070 121
460	6	114034
590	. 115	END96
790	. 102	
	THE REAL PROPERTY.	

The listing:

```
10 ****************
20 '
     HOME FINANCIAL STATEMENT
30 '
                BY
40 '
         ROLAND B. PORTILLO
50 '
60 '
           VERSION 2.2
70 '
            JULY, 1984
80 '**************
90 '
100 CLS:PRINT@164, "HOME FINANCIA
L STATEMENT":FOR X=1T01500:NEXT
110 VERIFYON: DIMA*(75), M(75), MM(
75),Y(75),YY(75)
120 X="######## , . ##": D=="s=######
,,##":K$="###.#"
130 CLS:PRINT@130, "ARE THERE ANY
MIDMONTH TOTALS":PRINT@170,"TO
ENTER: ": PRINTTAB(15) "":: :LINEIN
PUTR#: IFR#="Y" OR R#="YES" THEN
GOSUB 1210
140 CLS:PRINT@132,"To Enter CUMU
LATIVE TOTALS": PRINT@170, "press
<<ENTER>>":PRINT@256,"If no prio
r totals, enter 'NONE'"
150 PRINT@398,"";:LINEINPUTR#:IF
R$="NONE"THEN190
160 OPEN"I",#1,"BUDGET"
170 FORN=1T075
180 INPUT#1,Y(N):NEXT:CLOSE#1
190 FORN=1T075: READA$(N): NEXT
200 CLS: PRINT@135, "ENTER STATEME
NT DATE: ":PRINT@171,"";:LINEINPU
TM#: IF M#="" THEN 200
210 CLS:PRINT@32, "Enter 'END', 'S
UM' or budget code":PRINT@64.STR
ING#(32,"-"):PRINT@174,"";:LINEI
NPUTBC#: IFBC#="END"THEN300ELSEIF
BC$="SUM"THENGOSUB1160:GOTO210
220 IFBC*=""THEN240
230 A=VAL (BC$)
240 IFA>30ANDA<36THENPRINT@169."
HUSBAND'S CAR: "ELSEIFA>37ANDA<43
THENPRINT@169, "WIFE'S CAR: "
250 IFA=20THENPRINT@263.A$(16)
260 IFA>710RA<20RA=210RA=70RA=80
RA=150RA=160RA=280RA=290RA=300RA
=360RA=370RA=430RA=440RA=45THENS
OUND50,1:CLS:PRINT@170."NO SUCH
ACCOUNT"::FORX=1T0500:NEXT:GOT02
```

10 270 PRINT@202,A\$(A):PRINT:IFA=35 ORA=42THENPRINT" Enter as a neg ative amount" 280 PRINT:LINEINPUT" ENTER A MOUNT: \$ "; AM\$ 290 AM=VAL (AM\$):M(A)=M(A)+AM:AM= Ø:GOTO210 300 CLS:PRINT@164,"Will there be any additions before printing s tatement? "::LINEINPUTR#:IFR#="Y "ORR\$="YES"THENPRINT@352, "Enter first 3 letters of month:":PRINT TAB(12)""::LINEINPUTZ\$:GOTO1130 310 'to accumulate totals 320 FORN= 2TO6: M(7) = M(7) + M(N): Y(N))=Y(N)+M(N):NEXT:Y(7)=Y(7)+M(7)330 FORN=9TO14:M(15)=M(15)+M(N): Y(N) = Y(N) + M(N) : NEXT : Y(15) = Y(15) +340 FORN=17TO27:M(28)=M(28)+M(N) Y(N) = Y(N) + M(N) : NEXT : Y(28) = Y(28)+M(28) 350 FORN= 31 TO 35: M(36) = M(36) + M(N)Y(N) = Y(N) + M(N) = NEXT = Y(36) = Y(36)+M(36)360 FORN=38TO42:M(43)=M(43)+M(N) !Y(N) = Y(N) + M(N) : NEXT : Y(43) = Y(43)+M(43)370 M(44) = M(36) + M(43) : Y(44) = Y(36))+Y(43) 380 FORN=46TO71:M(72)=M(72)+M(N) Y(N) = Y(N) + M(N) : NEXT : Y(72) = Y(72)+M(72)390 M(73) = M(15) + M(28) + M(44) + M(72)):M(74)=M(7)-M(73):Y(73)=Y(73)+M(73):Y(74)=Y(7)-Y(73)400 'to calculate sales tax 410 FORN=53TO71:M(75)=M(75)+M(N) : NEXT 420 M(75)=M(75)+M(20)+M(26)+M(27)430 M(75)=M(75)+(M(32)/2)+(M(39)440 M(75) = M(75) + (.85 * M(51))450 M(75)=M(75)+M(50)-M(59)-M(62)-M(64)-M(67)-M(69)460 M(75) = M(75) - (M(75)/1.065):Y(75)=Y(75)+M(75) 470 'to compute % 480 FORN=2TO6: MM(N)=M(N)/M(7): YY (N) = Y(N)/Y(7) : MM(7) = MM(7) + MM(N) :YY(7) = YY(7) + YY(N) : NEXT490 FORN=9TO14:MM(N)=M(N)/M(7):Y Y(N) = Y(N) / Y(7) : MM(15) = MM(15) + MM(N): YY(15) = YY(15) + YY(N): NEXT500 FORN=17TO27:MM(N)=M(N)/M(7): YY(N) = Y(N)/Y(7): MM(28) = MM(28) + MM(N): YY(2B)=YY(2B)+YY(N): NEXT

510 FORN=31T035; MM(N)=M(N)/M(7): 640 PRINT#-2, CHR\$(14)" YY(N) = Y(N)/Y(7): YY(36) = YY(36) + YYINCOME STATEMENT": PRINT#-2, TAB((N): MM(36) = MM(36) + MM(N): NEXT24) "FOR MONTH ENDING ":M\$:PRINT# 520 FORN=38TO42:MM(N)=M(N)/M(7): YY(N) = Y(N)/Y(7) : MM(43) = MM(43) + MM650 PRINT#-2, TAB(42) "MONTH" TAB(5 (N): YY(43) = YY(43) + YY(N): NEXT3) "%"TAB(62) "Y. T. D. "TAB(74) "%" 530 MM(44) = MM(36) + MM(43) : YY(44) =660 PRINT#-2, TAB(6)A\$(1) YY(36) + YY(43)670 N=2:GOSUB950 540 FORN=46TO71:MM(N)=M(N)/M(7): 680 FORN=3T07:G05UB940:NEXT YY(N) = Y(N)/Y(7) : MM(72) = MM(72) + MM690 PRINT#-2:PRINT#-2,TAB(6)A\$(8 (N): YY(72) = YY(72) + YY(N): NEXT) 550 MM(73) = MM(15) + MM(28) + MM(44) +700 N=9: GOSUB950 MM(72): YY(73) = YY(15) + YY(28) + YY(4710 FORN=10T015:GOSUB940:NEXT 4) + YY (72)720 PRINT#-2:PRINT#-2, TAB(6)A\$(1 560 MM(74) = M(74) / M(7) : YY(74) = Y(7)4)/Y(7)730 N=17:GOSUB950 570 'to convert % 740 FORN=18TO20:GOSUB940:NEXT 580 FORN=1T075:MM(N)=MM(N)*100:Y 750 PRINT#-2, TAB(6)A\$(21) Y(N) = YY(N) * 1000 : NEXT760 N=22:GOSUB950 590 CLS:PRINT@162,"DO YOU WANT A 770 FORN=23TO28:GOSUB940:NEXT SCREEN PREVIEW? "::EXEC44539:IF 780 PRINT#-2:PRINT#-2, TAB(6)A\$(2 INKEY#="Y"THENGOSUB1160 600 'check if printer is ready 790 PRINT#-2, TAB(4)A\$(30) 610 IFPEEK (65314) / 2= INT (PEEK (653 800 N=31:GOSUB950 14)/2) THENI=1ELSEI=0 810 FORN=32T036:GOSUB940:NEXT 620 IFI=0THENCLS:PRINT@200,"PRIN 820 PRINT#-2:PRINT#-2, TAB(4)A\$(3 TER NOT READY": PRINT@420, "FRESS ANY KEY WHEN READY": EXEC44539 830 N=38:GOSUB950 630 CLS0:PRINT@236,"WORKING"; 840 FORN=39TO43:GOSUB940:NEXT

ARE YOUR WALKING FINGERS GETTING FOOTSORE?

Tired of typing in those long, but wonderful, programs from issues of **THE RAINBOW**? Now, you can get **RAINBOW ON TAPE** and give those tired fingers a rest. With **RAINBOW ON TAPE**, you'll be able to spend your time enjoying programs instead of just typing . . . typing them! All you need to do ever again is pop a **RAINBOW ON TAPE** cassette into your recorder, *CLOAD* and *RUN* any one you want.

Think of it! Not 10 or a dozen — but between 20 and 30 — programs every month from **RAINBOW ON TAPE**. All the really good programs from **THE RAINBOW!** All the long ones . . . so you don't have to type them in. Just *CLOAD* and *RUN*!



Now . . . The Best Color Computer Magazine Offers The Best Tape Service

RAINBOW ON TAPE single issue rate is: within the US \$10, Canadian rate \$12, all other countries \$12.

RAINBOW ON TAPE SUBSCRIPTION rate is: within the US \$80, Canadian rate \$90, all other countries \$105.

U.S. FUNDS ONLY, PLEASE.
KENTUCKY RESIDENTS ADD 5% SALES TAX.
WE DO NOT BILL IN ORDER TO HOLD DOWN COSTS.

VISA, MasterCARD and American Express accepted. All subscriptions begin with the current issue and back issues are available beginning with April 1982. Tapes are sent first class mail to arrive approximately the same time as your current issue of THE RAINBOW.

ORDER RAINBOW ON TAPE TODAY!

Software

The CoCo Calligrapher

The CoCo Calligrapher works on these printers:

Epson: MX80, FX80, 100 (8 1/2 x 11 size only),

and all models with graphtrax

Gemini: 10, 10X, 15, 15X (81/2 x 11 size only) Radio Shack: LP7, LP8, DMP100, 110, 120, 200,

420, 510, 2100

Okidata: 92A - unless it is version 4. The ROM has a bug and the dealer should replace it for you.

Banana: Behaves like a Radio Shack

Prowriter: 8510

These type styles come on the CoCo Calligrapher program tape or disk:

Old English
Gay Nineties

Cartoon

Tape - \$24.95 Disk - \$29.95 Both require 32K ECB These additional type styles are also available — \$19.95 each, or \$49.95 for all on tape or disk.

Tape 1

Old English-reduced Old English-reverse Old Englishreverse/reduced Cartoon-reduced Cartoon-reverse Cartoonreverse/reduced Gay Nineties-reduced Gay Nineties-reverse Gay Ninetiesreverse/reduced

Old English Cartoon Gay Nineties

Tape 2

Broadway

Broaduay

Broadway Broadway-reduced Broadway-reverse Broadwayreverse/reduced Tape 3

Business

Business Business-reduced Business-reverser Businessreverse/reduced

Old Style

Old Style
Old Style-reduced
Old Style-reverse
Old Stylereverse/reduced

Tontique

Antique Antique-reduced Antique-reverse Antique-

reverse/reduced

and Sugar Software Introduces . . .

Color Disk Manager

A disk utility which will handle virtually all of your disk related needs! **Color Disk Manager** will do selective initializations, verifies, backups and repairs.

- Handles multiple drives
- Make a backup of the directory
- Recover file command
- Repair or salvage crashed disks
- Gives allocation table map
- Displays file granule map
- Loads files 2 ways
- Kill file command
- Verifies tracks or entire disk
- Append sector command
- Transfers programs from tape to disk
- Rapid scan feature
- Dumps memory to screen
- Loads and executes rompacks saved on disk
- Move ROM to RAM command
- 64K compatible

Requires 32K - \$34.95

Color Tape Manager

A utility which will handle most of your tape related needs!

- Appends ML to Basic programs
- Displays start, end, and execute addresses of ML programs
- Converts ML programs to Basic data statements
- Displays memory in hex, decimal or ASCII
- Change memory in decimal or hex
- Rapid memory-scan using arrow keys
- Allows imput in hex or decimal
- Transfers control to other programs with a "go" command
- Moves blocks of memory from start through end address to new start address

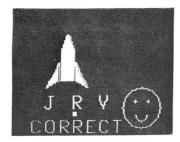
Tape requires 16K ECB - \$24.95 Disk requires 32K - \$24.95

PreReader

32K ECB;

Joystick Required

Tape - \$19.95 Disk - \$24.95

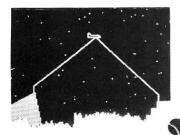


Level I - your child will work with colors, shapes, numbers, capital letters and small letters

Level II - your child will learn to associate individual letters and consonant blends with the sounds they make



Songs and happy faces for each correct answer!



Radio Szatan Dasign Calcalations

Helps design or evaluate:

- Land mobile radio systems
- Satellite TV
- Satellite data acquisition systems
- Aircraft radio systems
- Microwave systems
- Microvolt/DBM conversions
- Frequency/Wave length conversions 32K ECB
- System received signal levels
- Gain of parabolic antenna
- **Propogation Calculations**

\$29.95 - Tape \$32.95 - Disk

Rental Property

Income and Expense Management Package

Disk - \$34.95 32K Required

- Keeps track of all your rental properties
- Provides instant screen or printer summary of all your properties
- Maintains and prints a detailed, itemized listing of each of 28 expense categories
- Gives you a schedule of the Accelerated Cost Recovery System depreciation allowed for each tax year for 3, 5, 10 and 15 year property

SEMIGRAF **Graphics Editor**

- Graphics editor to create and modify your own pictures
- Pictures can be usd as a title screen for a program
- Create a series of pictures to make a slide show
- Both Extended and non-Extended Basic versions on the same tape
- High Resolution
- Semigraphic modes 8, 12, and 24 (64 x 64, 64 x 96 and 64 x 128)
- 8 colors
- Combine text with graphics
- Auto-repeat and "magic" delete
- Requires 16K



Tape - \$19.95 Disk - \$24.95

for the Programmer in the Family



- Creates a ML loader which automatically starts up your Basic or ML program
- Title screen utility
- Provide an audio introduction
- Locates your program at the desired address



32K Disk

\$99.95

PIRATECTOR!®

You write the Basic or ML program. Piratector™:

- Supplies protection scheme
- Includes Semigraf graphics editor
- Incrementing serial numbers
- Many user subroutines included Effective against popular piracy/

protection cracking programs

Dealer and author inquiries are always welcome. Canadian dealers should contact Kelly Software Dis-tributors, Ltd., P.O. Box 11932, Edmonton, Alberta T5J-3L1, (403) 421-8003.

Disk software compatible with Radio Shack DOS only.

SUGAR SOFTWARE

2153 Leah Lanc Reynoldsburg, Ohio 43068 (614) 861-0565

A complete catalog of other sweet Sugar Software products is available. Add \$1.00 per tape for postage and handling. Ohioans add 5.5% sales tax. COD orders are welcome. CIS orders EMAIL to 70405, 1374. No refunds or exchanges.

```
850 PRINT#-2:N=44:GOSUB950:PRINT
#-2.CHR$(12)
860 PRINT#-2, TAB(27) "MONTH ENDIN
G ":M$:PRINT#-2
870 PRINT#-2,TAB(6)A$(45)
880 N=46:GOSUB950
890 FORN=47T072:GOSUB940:NEXT
900 PRINT#-2:N=73:GOSUB950
910 PRINT#-2:N=74:GOSUB950
920 PRINT#-2:PRINT#-2.TAB(4)A$(7
5) TAB(37): PRINT#-2, USINGX$; M(75)
::PRINT#-2.TAB(57)""::PRINT#-2.U
SINGX*: Y(75)
930 PRINT#-2,CHR$(12):GDT0960
940 PRINT#-2, TAB(5)A$(N)TAB(38):
PRINT#-2,USINGX$; M(N); : PRINT#-2,
CHR$(15)TAB(56)"";:PRINT#-2,USIN
GK$; MM(N);:PRINT#-2,CHR$(18)TAB(
64) "": : PRINT#-2.USINGX$: Y(N):: PR
INT#-2, CHR$ (15) TAB (84) ""; : PRINT#
-2,USINGKs; YY(N):PRINT#-2,CHR$(1
8) ""; : RETURN
950 PRINT#-2, TAB(4)A$(N)TAB(37):
PRINT#-2,USINGX$;M(N);:PRINT#-2,
CHR$(15) TAB(55) ""; :PRINT#-2,USIN
GK$;MM(N);:PRINT#-2,CHR$(18)TAB(
63)"";:PRINT#-2,USINGX$;Y(N);:PR
INT#-2, CHR$ (15) TAB (83) ""; : PRINT#
-2,USINGK#;YY(N):PRINT#-2,CHR#(1
8) "":: RETURN
960 'to convert % back
970 FORN=1T075:MM(N)=MM(N)/100:Y
Y(N)=YY(N)/100:NEXT
980 OPEN"O",#1,"BUDGET"
990 FORN=1T075
1000 WRITE#1,Y(N):NEXT:CLOSE#1
1010 CLS:PRINT@65, "ENTER BACKUP
DISK FOR COPY AND":PRINTTAB(8)"
PRESS <ENTER>":EXEC44539:OPEN"O"
,#1,"BUDGET"
1020 FORN=1T075
1030 WRITE#1,Y(N):NEXT:CLOSE#1:E
ND
1040 DATA "
                SOURCES OF INCOME
:",Husband's salary,Wife's salar
y, Overtime, Interest earned, Misc.
 Income,"
                TOTAL"
1050 DATA"
               WITHHOLDINGS & PAY
MENTS: ",F.I.C.A., Federal Income
Taxes, State Income Taxes, Retirem
ent & Deferred Comp., I.R.A., Cred
it Union Loans,"
                        TOTAL"
1060 DATA "
                RESIDENTIAL EXPEN
SES: ", Mortgage Payments, Property
 Taxes, Insurance, Repairs & Maint
enance,"Utilities:"," Telephone
"," Electricity"," Gas"," Wat
er & Disposal"
1070 DATA Major Improvements, Fur
```

```
AUTOMOBILE EXPENSES: ", "Husb
and's Car:"," Insurance","
airs & Maintenance","
                       Licenses
            Gasoline"," Less Re
& Fines","
imbursements","
                     TOTAL"
           "Wife's Car:"."
1080 DATA
rance"," Repairs & Maintenance"
" Licenses & Fines"," Gasolin
e"." Less Reimbursements","
  TOTAL"."
                TOTAL AUTOMOBILE
 EXPENSES"
                OTHER EXPENSES: "
1090 DATA
,Union Dues,Life Insurance,Healt
h/Hospital Insurance, Medical/Den
tal, Pet Expenses, Meals Out, Food
Purchases, "Appliances, Dishes, e
tc.",Small Tools etc.,Work Relat
ed Expenses
1100 DATA Computer Expenses, Ste
reo/Video/Photo, Hobby Expenses, E
ntertainment, Physical Fitness Ex
penses, Personal Grooming & Hygie
ne, Vacation, Clothing, Laundry & C
leaning, Gifts etc., Flowers
1110 DATA Contributions, Magazin
es & Books,Bank/Finance charges,
Collectibles,Miscellaneous
1120 DATA "
                TOTAL","
                              TOT
AL EXPENSES"." ***CHANGE IN SAV
INGS***"." ----SALES TAX PAID--
1130 OPEN"O",#1,"MIDMONTH."+Z$:F
ORN=1T075:WRITE#1,M(N):NEXT:CLOS
1140 PRINTTAB(10) "INSERT BACKUP
DISK AND PRESS":PRINT:PRINTTAB(1
5)" 'C' FOR COPY":PRINT:PRINTTAB
(15) "'ENTER' TO END"
1150 EXEC44539: IF INKEY = "C" THE
N 1130 ELSE END
1160 CLS:S$="SUMMARY OF ACTIVITY
 TO DATE":PRINTTAB(3)S$:PRINT
1170 FORN=1TO75:C=C+1:PRINTUSING
           %"; A$(N); :PRINT"
:PRINTUSING"####.##";M(N);:PRINT
   "::PRINTUSING"########":Y(N)
1180 IFC=13THENC=0:EXEC44539:CLS
:PRINTTAB(3)S$:PRINT
1190 NEXTN
1200 IFN>75THENEXEC44539:C=0:RET
URN
1210 PRINT@261, "ENTER FIRST 3 LE
TTERS OF
              MONTH:
                       "::LINEINP
UTZ$:OPEN"I",#1,"MIDMONTH."+Z$:F
OR N=1 TO 75: INPUT#1, M(N): NEXT: C
LOSE#1:M(7)=0:M(15)=0:M(28)=0:M(
36) = 0: M(43) = 0: M(44) = 0: M(72) = 0: M(
73)=0:M(74)=0:M(75)=0:RETURN
```

nishing Purchases,"

TOTAL".



VISA

1-416-529-1319 PLEASE INCLUDE \$2.50 SHIPPING

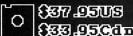


PRINTIMASTER

A field feetward season paint වන්න නිතන බලන වන්න කනනනෙන god be eldegree restairing gree ලවල්වුවෙන්වාවල ලැලුවෙන්නේ එම තලල asome edil rot eldellesse compater. This value packed ලුල ඉල් විද්යාවේම සහභාගයල evergones "mast bave" list. dust look of these perental specifications:- $\Delta_{\overline{u}}$ compatition. <u> කලෙනි වන්න්නෙ ලෙ</u> ලෙබ්වලේ ඇලක Breste Vestigeal and besisental (ලාගෙන්) ඉන්න්නේනේනේ වැල්ව යන නමන්වීමට පෙනෙන නම්වෙන්නෙන 8 color recognition & separation Vestigeel & bestgeetel යරුවනයවනයෙන <u> කියල්කම් කත්තම්කල</u> All of the above will work on ලයන යන පෙනෙන යුතුව සේවී ලංක්ෂියක මීවියම් ඉංස අලංක්ෂිල.



ලක්ක කුලකුල අතුත් කුලකුල



INTERNATIONAL 125 SOUTH FIFTH STREET LEWISTON, N.Y. 14092

<u>ROM MASTER</u>

Rownester is a ctrowit board with a rotary switch and sockets for three EFROM's (24 or 28 pin) that can be individually selected. You can now have up to three versions of Basic and three versions of Basic and three versions of Basic and three versions of the same time.

TOU TELEGUES THEM.

\$39.9505 2/\$75 \$49.9566m 2/\$95

Dowble sided prototype boards

89.95US 812.95Cdm

Blank kegboard overlags

SOUPLE OF

80.090da



Custom Software Engineering, Inc.

807 Minutemen Causeway (D-2), Cocoa Beach, Florida 32931

(305) 783-1083 For information or technical support, please call between 5:30 and 8:30 P.M. Eastern time.

GET ORGANIZED IN 1985

DATE-O-BASE CALENDAR puts YOU in charge of your schedule!

 Graphically displays any monthly calendar between 1700 and 2099. You put in up to twelve 28 character memos per day...calendar shows where the memos are...call up of day shows details.

SU	DM	TU	ME	TH	FR	SA
		1	2	3	4	5
6	2	8	9.	10	11	12
13	1.4	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		
	-	-	-	+	+-	+

- Use for appointments or a log of past activity.
- Search capability allows you to list or print all memos between two specified dates or only ones meeting key-word criteria.
- Date computation shows elapsed time between two dates in days, weeks, months and years.
- Requires 32K in BASIC

TAPE DATE-O-BASE CALENDAR - \$16.95 (max. 400 memos/

DISK DATE-O-BASE CALENDAR - \$19.95 (over 4000 memos/ disk...max. 300 memos/month)

DISK DOUBLE ENTRY

If you have spent hours trying to balance your Debits and Credits, DISK DOUBLE ENTRY is for you!

- Designed for small business, club and personal use.
- Enter transactions in a journal type format. Program will maintain current account balances, produce Trial Balance, Income, and Balance Sheet reports and complete Account Ledgers.
- Will handle up to 300 accounts including report headings and
- Up to 1400 average transactions on a diskette.
- Summary reports and four levels of subtotals available.
- Requires 32K and an understanding of standard double entry accounting concepts.

\$44.95 in BASIC with Machine Language subroutines.

STATEMENT WRITER

For use with (and requires) Disk Double Entry

- Produces statements suitable for billing from your Receivables accounts.
- Provides mailing labels to use with your statements and account summaries.
- Designed and documented to allow you to change formats to accommodate your own special needs.

\$34.95

That's INTEREST-ing

Let your computer do some REAL computation!

- Helps you solve problems dealing with time, money, and INTEREST!
- AMORTIZATION TABLES any way YOU want them...even lets you change any terms mid-schedule!
- Calculates Present Value, Future Value, Capital Recovery for any combination of payments you specify.
- Rate of Return computation predicts how hard your money will be working for you!
- Computes Bond yields...current and to redemption.
- All answers available on screen or printer.

\$29.95 in BASIC

For VISA and Master Card orders: Include type, account number, expiration date, signature and phone number. Sorry! No COD's.



GRAPHIC SCREEN PRINT PROGRAM

Works in all PMODES and lets you shift screen image anywhere on the printed page.

- Relocatable code lets you use all of your 16K or 32K machine.
- Available in Color Basic 1.0 and 1.1/1.2. Use EXEC 41175 to see which you have and SPECIFY WITH ORDER.
- SPECIFY PRINTER TYPE...in Machine Language

\$7.95 - TRS-80° LP-VII/VIII & DMP 100/200/400/420

\$9.95 - Epson GRAFTRAX®, NEC® PC 8023 A-C, IDS 440/445, Paper Tiger® 460/560, Micro Prism® 480, Prism® 80/132 (with dot plotting), TRS-80° DMP-120, DMP-110, TDP-1, PROWRITER® Centronics 739, Microline® 82A/83A (with Okigraph 1) /84/92/93, Star Micronics, Inc. GEMINI 10/10x/15 and Gorilla Banana (Trademarks of Tandy Corp., Epson America, Inc., C-Itoh, NEC America, Okidata Corp., Integral Data Systems, Inc.)

ALPHA-DRAW

Works great with GRAPHIC SCREEN PRINT PROGRAM!

- Subroutine designed to let you add any keyboard character to your graphic displays.
- You define X and Y coordinates and a string variable of one or more characters...ALPHA-DRAW does the rest!
- BONUS includes instructions for a true line-numbered merge of tape files.

\$8.95 in BASIC



HELP YOUR CHILDREN THEMSELVES

MATH TUTOR

- 5 Programs in 1...ranges from simple addition through long division with 4 levels of difficulty.
- Requires regrouping to be shown...provides for trial quotients in long division.
- Shows how to correct errors...step by step approach stresses accuracy.

\$13.95 in BASIC

SPELLING TEACHER

- Teaches students their own word lists...tape or disk files hold up to 200 words each.
- Suitable for any level from kindergarten to college.
- Misspelled words are retaught to reinforce correct spelling.
- Words presented in 4 lively formats study, scrambled word game, trial test, final test.

\$12.95 in BASIC

ALL PROGRAMS require Extended Color Basic and are delivered on cassette. All, except Tape Date-O-Base Calendar, are DISK System compatible.

U.S. and CANADA add \$1.00 per order for shipping. Overseas \$2.50 per order. All prices in U.S. dollars. Florida residents add 5% sales tax. Return within two weeks if not completely satisfied



ALL LISTED **PROGRAMS**





Further Venturing With Program Tables

By Joseph Kolar **Rainbow Contributing Editor**

ou may just as well get last month's issue of THE RAINBOW and page to the "Taking BASIC Training" article.

Everyone is encouraged to save all back issues of THE RAINBOW. All beginners are urged to buy all available back issues that may have been missed. Each issue is equivalent to a good-sized text book and contains a wealth of information. All RAINBOW issues should become a valued part of your CoCo reference library.

As the beginner progresses through BASIC, he will find many new vistas opening up. Articles that were incomprehensible many moons ago will now have new significance. After all, the object of "Taking BASIC" is to whet the newcomer's appetite to partake of more complex programs and progress further to dine on "gourmet fare."

In reference to Listing 1, in last month's article (which you were asked to put on cassette tape), in program lines 130, 140 and 150 you could insert SEE, and change GOTO 180 to GOTO 200.

(Joseph Kolar is a free-lance writer and programmer dedicated to proselytizing for computers in general, and the CoCo specifically.)

In lines 160 and 170, insert SEES, and change the GOTO 190 to GOTO 200. Delete lines 180 and 190, and you will get the same result. It just proves there is more than one way to skin a cat.

In effect, this makes columns 1 and 2 in Table 1 a new Column 1 and eliminates Column 2.

You may also desire to add more words to any column to get an even more varied assortment of sentences to study. For instance, change Line 110 to X = RND(7) and add at the end of Line 120: ,171,172.

> 171 PRINT" HE SEES ":: GOTO200 172 PRINT" SHE SEES ":: GOTO200

If you enjoy experimenting, add a verb such as "hear" above the horizontal line of Table I and "hears" below the horizontal line (remember, we are still discussing last month's lesson).

Use the original listing or the modified one and figure out how to integrate the two verbs into the program. There are many ways to do it and it makes a neat puzzle to solve.

Listing 1 is the altered version of last month's listing. You may choose to CLOAD your saved copy, key in Listing 1 or merely follow this month's continuation.

Refer to Table 1; make a rough working copy of it. It is assumed you have mastered the program developed last month and understand how to use the table.

Notice the dividing horizontal lines in columns 1, 3 and 7. This means that in this particular group of random sentences, the pronouns in columns 3 and 7 agree with the masculine nouns. Conversely, the third person feminine pronouns agree with the feminine nouns. Even though both the "boys" and "girls" can call the present or past tense in Column 2, the verbs in columns 4 and 8 must be in the same tense as those in Column 2.

If you attempt to create sentences from this table without the above restrictions, you are apt to get foolish sentences such as: "Joe thought she knows Greek but he didn't." To create acceptable sentences, we have to turn to string variables.

To temporarily bypass the CLOADed listing, add:

> 10 GOTO 400 400 CLS:FOR I=1 TO 6:PRINT:NEXT

Program Line 400 clears the screen and locates our first line of created text on the sixth screen line.

The nouns in Column 1 and the pronouns in Column 3 will have to be turned into string variables.

```
410 B$=" JOE ":C$= GEORGE ":D$="HE "
420 E$=" DIANA ":F$= DLIMPIA ":G$="SHE "
```

Note that nouns have two spaces in front of the names for indentation purposes and one space after to allow for spacing between the noun and the next word. The two pronouns have only a space at the end for the same purpose.

The rule is that each word will allow for the spacing between it and the following word with space after the word, before adding the closing quotation mark. Now, for the three sets of verbs:

```
430 L$="THINKS ":M$="THOUGHT"
440 N$="KNOWS ":O$="KNEW"
450 P$="DOESN'T ":Q$=DIDN'T"
```

Using the RND(x) function, we may begin creating the four nouns in Column 1, by choosing and then printing the appropriate variable:

```
460 X=RND(4):ON X GDTO 470
470 PRINT B$;
480 PRINT C$;
490 PRINT E$;
500 PRINT F$;
510 GOTO 510
```

Line 510 is a convenient but temporary pause to allow us to check out work in progress. Run the listing. Depending on what value 'X' equals, you will be shocked to get from one to four names with three spaces between names. Can you guess why?

Since we want pronouns to agree with the gender (male or female), we must allow for them. Thus, Z\$=D\$ (he) only when a masculine noun is chosen by impartial CoCo. Z\$=G\$ (she) when a feminine noun is called. Add to both lines 470 and 480:

<: Z\$=D\$>

To lines 490 and 500 add:

(: Z\$=G\$)

Now, add to lines 470-500:

(:60TO 510)

In Column 2, CoCo has a choice of two tenses. In Column 3, we have pronouns that must agree with nouns in Column 1. In Column 4, we have verbs that must agree in tense with those in Column 2. Key in: 510 X=RND(2): ON X 60TO 520,530 520 PRINTL\$; Z\$;: ZZ\$=N\$: PRINTZZ\$;: 60TO540 530 PRINTM\$; Z\$;: ZZ\$=O\$: PRINTZZ\$; 540 60TO 540

Run repeatedly, checking for mistakes. Since the noun can call either tense, lines 520 and 530 give us the two verbs (L\$ or M\$). We allowed for the proper pronoun, Z\$ (lines 470-500). We set up ZZ\$ to equal either N\$ or O\$, and print the appropriate verb from Column 4 that agrees in tense with the verb in Column 2.

Note at this time that when a sentence begins with OLIMPIA, only five spaces remain at the right-hand margin. Obviously, the nouns in Column 5 will split into two text lines on the screen.

Set up the program line numbers for the Column 5 nouns by keying:

540 X=RND(4): ON X GOTO 550,560,570,580

We use PRINT® to locate the next text word on the second text line at the left margin.

```
550 PRINTe224, "RUMANIAN ";:50T0 590
560 PRINTe224, "GREEK ";:60T0590
570 PRINTe224, "LATIN ";:60T0590
580 PRINTe224, "FRENCH ";
590 GOTO 590
```

Run repeatedly and weed out any errors. Rewrite Line 590 to read:

590 PRINT"BUT "; Z\$;

The above line adds the only word in Column 6 and Z\$ adds the correct pronoun from Column 7. (Recall that we told CoCo in lines 470-500 whether Z\$= "he" or "she.")

600 GOTO 600

Run the program and check.

To get the correct tense we desire from Column 8, we tell CoCo:

600 IF ZZ\$=N\$ then AA\$=P\$ 610 IF ZZ\$=O\$ then AA\$=Q\$ 620 PRINT AA\$

If ZZ\$ is the present tense, then AA\$ would be the present tense, etc.

At this point, it is time to center both text lines. Run repeatedly to check the length of the first line of text. The longest line of text is "Olimpia thought she knew." (You could also count the characters and spaces between words,

using Table 1, to find out the number of spaces remaining at the right side.) It is always better to visually inspect your handiwork.

The longest line of text leaves five blank spaces on the right. This indicates it is safe to add three spaces in front of all initial sentence words in Column

Edit lines 410 and 420. Insert three additional spaces between the first quotation mark and the first character of the noun in B\$, C\$, E\$ and F\$. Now, the first line of text will be pushed over toward the right; run this repeatedly. The first text line is fairly well-centered.

Looking at the second line, we note that rather than beginning at the left margin, it would look more attractive if we moved the line of text over two or three spaces; let's try three spaces. Edit lines 550-580. Change the value of 224 to 227 in each line and run.

You may not like this, so change 227 to 226 in lines 550-580 and run. Somehow, it looks better. You may still not like what you see, so try one space (225), and perhaps you prefer to begin at the left margin. You choose! Try them all and pick your preferred format.

To operate the program, we decide to press 'G' and to get out of the program, press 'H.' Key in:

630 A\$=INKEYS: IF A\$="6" THEN CLS:60T0400 640 IF A\$="H" THEN CLS: 60T0 650 ELSE 630

To integrate last month's program, which we bypassed in order to develop this month's sentence, DEL 10 and delete from Line 370 ELSE 370 and add:

380 IF A\$="H" THEN 400 ELSE 370

Note that 'H' will advance to the next group of sentences in Line 380 and in 640 will jump out of the program.

Make a closing panel.

650 CLS(3):PRINT@235," THE END "; 660 6010660

We must change the instructions at Line 50 (see Listing 2).

Naturally, you could add other tables to make this a long, varied and interesting study session for the pupil.

I hope you enjoyed creating this program. Remember, there are other ways to make portions of this program. Needless to say, you can add modifications and improvements; make up a nice title page of your own design.

Elite Software

NOW AT:



Available Via Express Order

What to look for when buying application software . . .

EASE OF USE-At Elite Software we know you want programs that are easy to use. You want software that has a simple command structure with commands that are easy to remember. We've had NINE magazine reviews that acknowledge the ease-of-use of our programs. • FEATURES-Elite Software has powerful features. Why buy an island (one program that does only one job)? Remember, when you buy one program from our system, you also get EXPANDABILITY. • PERFORMANCE SPEED—Some application programs run disappointingly slow. At Elite Software we pay careful attention to things like Sorting, Screen Re-write, Calculation, and Output processing times. Not all software "plays" the same. Elite Software DOES make a difference.

Elite-Calc

Elite-File

All of our Software Features:

★ Superior Ease of Use

- ★ Cross-file Compatability
- ★ Printer Compatability
- ★ Comprehensive Manual
- ★ Nationwide User-group Support
- * Handsome Vinyl Binder
- ★ Revision Upgrade Program

Elite Software

Radio Shack is a trademark of Tandy Corporation





Now Available For: WORD-PAK SAME POWERFUL FEATURES + 80 COLUMN DISPLAY

Specify Disk or Tape \$79.95 + Shipping/Handling.



Now Available For: WORD-PAK

SAME POWERFUL FEATURES + 80 COLUMN DISPLAY Specify Disk or Tape \$79.95 + Shipping/Handling.

SEE NEXT PAGE FOR ORDER INFO . . .

Elite Software 201 Penn Center Blvd., Suite 301, • Pittsburgh, PA 15235 • (412)795-8492

THE SECOND GENERATION WORD PROCESSOR IS HERE! ELITE. WORD is a high performance, all machine language, Full Screen Editor which offers an ease-of-use that is simply incredible. ELITE. WORD has many powerful features not found in other word processors for the Color Computer. ELITE . WORD also offers a printed output flexibility that can handle your sophisticated home and business applications.

LOOK at these features:

Very easy to use . Top screen line reserved for HELP display/Command prompts . Excellent for BOTH program editing and word processing . TWO text entry modes; Insert or Exchange . Auto Key-Repeat . Smooth display scroll for easier proof reading . True Upper/Lower case display with lower case descenders . Hi-Res text "View" mode displays text exactly as it will be printed; including text Justification, Auto Line Centering, dynamic Margin changes, Top and Bottom Margins, Page Numbering, and Page Breaks . Include feature (disk only) permits including several file names within one output document; total document will have sequential page numbering if desired . Fast Disk I/O; no loading of overlay files to slow down operation • Variable Text (Mail Merge) capability for Form Letter generation included FREE!

32K Extended Basic Required for ROM routine calls . Variable TAB stops • User definable Headers and Footers • Smooth cursor movement over text; in any direction (including vertical) • Page Forward or Backward through text • Jump to beginning or end of text • Automatic text centering • Automatic text Word-Wrap if desired • True Block text Move, Delete, or Copy • Delete entire screen line • Backspace and Delete Character • Delete character above cursor • Find a string of characters . Global Replace character string . Two Hi-Res screen displays; 32 x 19 for text entry/editing, 64 x 19 for formatted text viewing . Continuous Memory display . Over 22K file size in 64K machines • Easy generation of ASCII files • Save/Load text files (in ASCII if desired) • Program remembers last File Name loaded or saved, and will write to it by default if desired . All I/O errors trapped and recoverable . Disk commands for Change Drive, Directory and Free Space • Print Format features allow user to specify Left Margin, Line Length, Line Spacing, Top and Bottom Margin, Duplicate Copies, Right-Side text Justification, Page Pause, Page Numbering, and more • Dynamically change any print Format features within text • Imbed Hex codes and printer Font changes within text.

Additional OS-9 version features:

Edit two files simultaneously • Save or Print only a portion of the text buffer • Edit files larger than memory (uses disk as buffer) • Block Copy from one file to another • Execute any OS-9 command from Editor

If you want powerful features AND a program that's EASY TO USE, Elite Word is for you . . .

Elite-Word TAPE RS#90-0183 Elite-Word DISK RS#90-0184 Elite-Word/OS-9 RS#90-0186

THE BEST FOR ONLY Specify Tape \$ 69.95 RS Disk \$ 69.95 OS-9 Disk \$ 79.95 OS-9 & RS Disk \$115.95

"Elite•Word is a terrific word processor with an impressive list of features, yet it's easy to learn and use."
—Stuart Hawkinson, HOT COCO

"I was more than satisfied with Elite•Word . . . After the review, I would not hesitate to compare it with the two best selling word processors. And my comparison places it at the top of the list."

-A. Buddy Hogan, RAINBOW

Elite · Spel

Elite Spel is an excellent spelling checker for your Color Computer, and its VERY FAST ... that's the key. Why wait while a spelling checker does its job? Elite Spel identifies all potentially misspelled words with a single pass through its perfectly adequate 24,000 word dictionary. Elite Spen lets you Add or Delete Dictionary words EASILY. Elite Spen is fully compatible with Elite• Word and will work with ASCII files from other programs.

MAJOR features include:

Easy to use, menu commands . Can learn 4,000 of your own words . List suspect words on screen or printer . Alphabetical listing of all words used with number of occurrences . Learn entire files of words . Can also "edit spelling in context" if desired . Works in single or multiple drive systems . 32K Disk required.

Radio Shack ® Catalog #90-0185

Speed is the key . . . Elite•Spel has it!

Available on \$29.95
Disk only

When purchased with ELITE • WORD . . . ONLY \$15.00

★ COLOR COMPUTER COMMUNICATIONS ★

Elite · Comm

Elite Comm turns your Color Computer into a powerful 300 Baud terminal. With Elite Comm you can access large main-frame computers, local computer bulletin boards, and national computer database services. Elite. Comm is fully compatible with Elite Word and will work with ASCII files from other programs. If you want a terminal communications package that is smooth and easy to use, Elite Comm is for you.

CHECK these program features:

Fully interrupt driven; you can talk to the host while it's talking to you and NOT drop a character . True Upper/ Lower case screen display • Selectable text Word-Wrap Review buffered text at ANY TIME • Selectable Smooth-Scroll in Review mode • Screen page Forward or Backward through buffered text . Save/Load buffer files . Transmit files to host computer . Print buffered text or saved files . 32K Required.

Elite • Comm is SMOOTH operation that's **EASY TO USE!**

Specify Tape or Disk

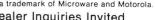
\$29_95



Productive Programs for Serious Users



Add \$3.00 shipping and handling PA Residents add 6% Sales Tax OS-9 is a trademark of Microware and Motorola.



Dealer Inquiries Invited Box 11224 • Pittsburgh, PA 15238 • (412) 795-8492



Elite-File

COLOR COMPUTER WORKSHEET * Available Calc-List ite-Calc

THIS IS IT! ELITE FILE is the Data Base Manager that Color Computer users have been waiting for. ELITE•FILE is for everyone who needs to store and retrieve information. ELITE FILE is a full-featured relational Data Base Manager with all the editing and report formatting features that are typically found on much larger computer systems. COM-PARE the others for record structure flexibility, total record capacity, information processing ability, speed of program response, printed output flexibility, and you'll agree that ELITE•FILE may very well be the most powerful/useful program ever written for the Color Computer.

No other File Manager gives you these features: All machine language for speed • Flexible, user defined. data record structures . Up to 255 characters per record field • Up to 255 fields per record • Up to 2000 characters per record • Up to 4000 records per file • Up to 16 files can be open at the same time for information processing . Edit, Scan, Sort, Select Record information; all done FAST . Output reports to Screen, Printer, or ASCII Disk file . Place output data by Field Name, with Custom Text anywhere on the printed page . Perform math operations (+, -, *, /) between Field contents . Produce tabulated reports from multiple record contents . Generate column totals across record field contents.

Compatible with Elite Calc and Elite Word files . User friendly combination of Menu driven input, and single key commands . Supports up to 4 drives . Minimum 32K RAM, Disk required . Nested sub-field definitions • Up to 8 fields in Primary Key • Copy record definition from file to file . View/Print record definition . Input/Add records with easy to use field name format display . Edit records with full screen "type over" editor . Copy records to repeat identical data . Load Elite. Calc worksheets into random access data files. Scan mode for quick data retrieval . Locate any record by field contents . Select specific groups of records by field content with full logic combination capabilities . Sort records in ascending or descending order by any field, or group of fields . Calculate values from combinations of field contents . Output any subset of fields in any order for printed reports • User setable print formats; Page Title, Top and Bottom Margin, Line Spacing, Page Length, Page Pause, Form Feeds and more • Output format also supports TAB, VTAB, CR, PAGE, text, HEX printer controls, and more . Join up to four sub-files to extend data record for printing . Produce detailed repetitive reports, for output on preprinted forms, using output formats written on Elite•Word • Variable Text Insert feature of Elite•Word is fully supported • Refile old record data into NEW record structures • Data, Field Definitions, Indices all stored on a single file • Memory resident no program overlays from disk . Single program performs all features • List disk Directories and "Kill" files without leaving the program . Data files also accessible from BASIC programs.

Radio Shack® catalog #90-0189

COMPARE features and performance speed ... you'll agree that Elite•File is the one to buy.

THE BEST FOR ONLY

\$74.50 Disk Only

Elite Software

NOW AT Radio Shack

STORES

Available via Express Order

Radio Shack is a trademark of Tandy Corporation

ELITE CALC was the first Color Computer spreadsheet program offering "major league" features. All the magazine reviewers loved it! Today, when you consider program performance speed, ease of use, price, and total features ... ELITE CALC is still your best choice.

MAJOR features include:

Very EASY to use . FAST Sorting . Printed Output. Screen Re-write, and Calculations all done FAST . Full cell-edit capability . Powerful cell-format options Individual cell formulas • FREE sample worksheets CALC-LIST availability.

Single character commands • Help displays • 255 maximum rows • 255 maximum columns . Available memory always displayed . Rapid Entry modes for text and data . Selectable, automatic, cursor movement • Insert, Delete, Move entire rows or columns • Replicate one cell to fill a row or column with selectable formula adjustment . All machine language for speed • Extended BASIC required for ROM routine calls . Automatic memory size detection for 16K, 32K, or 64K • > 20K bytes storage available in 32K systems • Math operators: $+, -, \times, /, \uparrow, (,) \bullet$ Relation operators: $=, >, <, <=, >=, <> \bullet$ Logic Operations: AND, OR, NOT . Conditional Formula: IF, THEN, ELSE • Trig Functions: SIN, COS, TAN, ATN • Log Functions: LOG, EXP, SQR • Misc. Functions: INT, FX, ABS, SGN, RND • Range Functions: SUM, AVERAGE, COUNT, MIN, MAX, LOOKUP . Definable constant table • User definable printer set-up commands Individual column width settings . Adjustable row height to insert blank lines without wasting memory . Hide columns or rows . Alternate print font selectable on a cell by cell basis . Display/Print formats set by cell, row, or column . Dollar format, comma grouping, prefix or postfix sign . Scientific notation, fixed point and interger formats . Left and Right cell contents justification . Full page formatting . All formats stored with worksheet on disk (tape) . Save/ Load Disk (tape) files in compact memory form . Scan disk directories . Output ASCII file for word processor input capability . Memory resident code ... no repeated disk calls.

CALC-LIST is a separate, machine language, utility that works independently of Elite Calc. It can read either tape or disk worksheet files, and will give you additional information that was previously "hidden" within your worksheet. With CALC-LIST, you can list on the screen (or print) the actual contents of your worksheet cells, including FORMULAS. You get all the valuable worksheet format data including assigned Column Widths, all cell Format specifications (\$, C, I, F#, G, etc.), Constant table assignments, and Printer Format information (Set-up, Page Length, Line Width, etc.). Use your CALC-LIST printout as a hardcopy backup of your worksheet for review or archival purposes. You can even let your friends use the listing so they can type your worksheets.

Elite-Calc TAPE RS catalog #90-0187 Elite-Calc DISK RS catalog #90-0188 Specify Tape or Disk Calc-List \$24.95 Elite • Calc and Calc-List \$79.95

"Elite•Calc is a great spreadsheet program! This professional quality program has the performance required for serious home applications as well as small businesses."

-Stuart Hawkinson, RAINBOW

'Truly one of the best programs I have seen."

-John Steiner, MICRO

"Elite●Calc is an extremely powerful worksheet . . ." —Jack Lane, COLOR MICRO JOURNAL

"Bruce Cook's Elite•Calc is a very fine program indeed; potentially one of the great Color Computer Programs." "... a very impressive product."

-Scott L. Norman, HOT COCO

Listing 3 creates the routines for the sentences created in Line 400, using GDSUBs instead of GDTDs. If you care to explore, alter the second sentence program you developed using Listing 3 as a guide, to use GDSUBs instead of GDTDs. It is always good to know alternate solutions and the only real way to learn them is to experiment on the old CoCo.

1	2	3	4	5	6	7	8
JOE	3/			RUMANIAN			
GEORGE	THINKS	HE	KNOWS	GREEK	BUT	HE	DOESNT.
DIANA	THOUGHT	SHE	KNEW	LATIN		SHE	DIDNT.
ÓLIMPIA				FRENCH			

Table X

Listing 1: Ø 'LISTING1 MODIFIED FROM FEB.'8 5 'RAINBOW' 50 CLS(Ø): PRINT@128," TO STUDY THE SENTENCES IN THISPROGRAM, P RESS THE <g> KEY. RE-PEAT THIS PROCEDURE UNTIL YOU ARE FINISH 360 PRINT"DICTIONARY.":GOTO3 370 A\$=INKEY\$: IF A\$="G" THE S:GOTO100 ELSE370 250</g>	N CL
5 'RAINBOW' 50 CLS(0): PRINT@128," TO STUDY THE SENTENCES IN THISPROGRAM, P RESS THE <g> KEY. RE-PEAT THIS PROCEDURE UNTIL YOU ARE FINISH 370 A\$=INKEY\$: IF A\$="G" THE S:GOTO100 ELSE370 250</g>	N CL
	245
ED WITH THE TABLE."	
60 PRINT: INPUT " PRESS Listing 2:	
(ENTER)"; OA 0 'LISTING2	
100 CLS 50 CLC/G) - DDINTG130 U TO C	TUDY
105 FOR I=1 TO 6:PRINT:NEXT 110 X=RND(7) THE SENTENCES IN EACHTABLE,	
120 DN X GOTO130,140,150,160,170 SS <g>. WHEN YOU ARE READY</g>	TO G
171 172 O TO THE NEXT TABLE, PLEASE	
130 POINT" I CEE ". COTTO DO SO CHE. REPEAT THIS PROLET	
140 PRINT" WE SEE "; GOTO20 UNTIL YOU FINISH ALL THE TA	IBLES
40 DEINT-INDIT "	RESS
150 PRINT" YOU SEE "; 1601020 <fnter>": 04</fnter>	
100 CLS 160 PRINT" JOE SEES "; GOTO2 100 CLS	
105 FUR I=1 IU 6:PRINI:NEXI	
170 PRINT" OF IMPIA CEEC "COT 110 X=KND(5)	
120 UN X GUTUIS0,140,150,160	
1/1 PRINT" HE SEES "; GUIUZ 140 PRINT" ME " COTO15	
150 PRINTIL VOLUME COTOLS	
172 PRINT" SHE SEES ";:GOTO2 160 PRINT" JOE ";:GOTO19	
200 Y=RND(5):ON Y GOTO210 220 23 170 PRINT" OLIMPIA ";:GOTO	190
0 240 250 180 PRINT"SEE ";:GOTO200	
210 PRINT"HIM "GOTO240 190 PRINT"SEES ";:GOTO200	
220 PRINT"HER ";:GOTO260 200 X=RND(5):ON X GOTO210,22	0,23
230 FRINI THEM ; 10010200 210 PRINTHUM H COTO2/0	
240 PRINT"GEORGE ";:GOTO260 220 PRINT"HER ";:GOTO260	
260 X=RND(2):ON X GOTO270,280 230 PRINT"THEM ";:GOTO260	
270 PRINT"OPENING": GOTO290 240 PRINT"GEORGE ";: GOTO260	
280 PRINT"SHUTTING": GOTO290 250 PRINT"DIANA ";: GOTO260	_
290 X=RND(2):ON X GOTO 300,310 260 X=RND(2):ON X GOTO270,28	0
See FRINIEZZO, H ;: BUIUSZE SOR DDINIEZZONE COTOCOR	
OTO TRINIEZZY, THE JEDUIOZZO COM V-DND / DOTO TOO	10
320 X=RND(4): ON X GOTO330, 340, 300 PRINT@225, "A ";:GOTO320	
330 PRINT"DOOR. ": GOTO370 310 PRINT@224, " THE ";: GOTO3	20
340 PRINT"WINDOW.":GOTO370 320 X=RND(4): ON X GOTO330,	340,
350 PRINT"BOOK.":GOTO370 350,360	

330 PRINT"DOOR.":GOT0370 340 PRINT"WINDOW. ": 60T0370 350 PRINT"BOOK.":GOT0370 360 PRINT"DICTIONARY.":GOTO370 370 A\$=INKEY\$: IF A\$="G" THEN CL S:GOT0100 380 IF A\$="H" THEN 400 ELSE 370 400 CLS:FOR I=1 TO 6:PRINT:NEXT 410 B\$=" JOE ":C\$=" GEORGE ":D\$="HE " 420 E\$=" DIANA ":F\$=" OLIM PIA ":G\$="SHE " 430 L\$="THINKS ":M\$="THOUGHT " 440 N\$="KNOWS ": O\$="KNEW " 450 P\$="DOESN'T. ":Q\$="DIDN'T. " 460 X=RND(4): ON X GOTO470,480,4 90,500 470 PRINT B\$;:Z\$=D\$:GOTO510 480 PRINT C\$::Z\$=D\$:GOTO510 490 PRINT E\$;:Z\$=G\$:GOTO510 500 PRINT F\$;:Z\$=G\$:GOTO510 510 X=RND(2):ON X GOTO520,530 520 PRINTL*; Z*; : ZZ*=N*: PRINTZZ*; : GOTO540 530 PRINTMs; Zs; : ZZs=Os: PRINTZZs; 540 X=RND(4):ON X GOTO550,560,57 550 PRINT@226, "RUMANIAN ";:GOTO5 560 PRINT@226, "GREEK ";:GOTO590 570 PRINT@226, "LATIN ";:GOTO590 580 PRINT@226, "FRENCH ": 590 PRINT"BUT "; Z\$; 600 IF ZZ\$=N\$ THEN AA\$=P\$ 610 IF ZZ\$=0\$ THEN AA\$=Q\$ 620 PRINTAA\$ 630 A\$=INKEY\$:IF A\$="G" THEN GOT 0400

640 IF A\$="H" THEN CLS:GOTO650 E LSE 630 650 CLS(3):PRINT@235," THE END " 660 GOTO 660 Listing 3: Ø 'LISTING3***ANOTHER WAY TO MAKE THE SENTENCES (LINES400- IN LISTING2 USING GOSUB'S INSTEAD OF GOTO'S. 100 CLS:FOR I=1 TO 6:PRINT:NEXT JOE ":C\$=" 110 B\$=" GE ": D\$="HE " 120 E\$=" DIANA ":F\$=" OL IMPIA ":G\$="SHE " 130 L\$="THINKS ":M\$="THOUGHT " 140 N\$="KNOWS": O\$="KNEW" 150 P\$="DOESN'T.":Q\$="DIDN'T."

160 GOSUB2000:GOSUB2100:GOSUB220

170 PRINT"BUT "; Z\$; 180 IF ZZ\$=N\$ THEN AA\$=P\$ 190 IF ZZ\$=O\$ THEN AA\$=Q\$

200 PRINTAA\$
210 A\$=INKEY\$:IF A\$="G" GOTO 100

ELSE 210 2000 X=RND(4):ON X GOTO2010,2020

2010 PRINTB\$;:Z\$=D\$:RETURN
2020 PRINTC\$::Z\$=D\$:RETURN

.2030.2040

2030 PRINTE\$;:Z\$=G\$:RETURN

2040 PRINTF\$;:Z\$=G\$:RETURN

2100 X=RND(2): ON X GOTO2110,212

2110 PRINTL*; Z*; : ZZ*=N*: PRINTZZ*
:RETURN

2120 PRINTM\$; Z\$;: ZZ\$=O\$: PRINTZZ\$

Qu'Appelle?

There is an old legend, handed down through generations of Canadian plains Indians, which tells a tragic tale of two lovers.

A young Indian brave, so the legend goes, was on his way to his wedding, a journey of many days. He was making his way down a beautiful river valley, interspersed with many lakes, when he heard his name called. The caller seemed to be his lover. But that couldn't be. She was still days away.

"Who calls?" he asked from his drifting canoe.
"Who calls?" was his only answer -- a lonely echo;

nothing more.
Yet, he was so sure...

When, finally, he arrived at his beloved's home, he was greeted with tears of sorrow and told the tale of his lover's illness and untimely passing. And as she crossed from this world into the next, he was told, with her last breath she called his name.

She had died the very moment he had heard her call his name while he made his way toward her -- down the Qu'Appelle Valley.

Qu'Appelle is French for "Who calls" and was the name given to the river and valley which pass through the plains of Saskatchewan in the heart of Canada.

Now, from the shore of Echo Lake in the beautiful Qu'Appelle Valley a call is going out again. This time it is to CoCo users everywhere.

A new (and different) news magazine, made especially for your CoCo and you, is about to be launched — from the shore of Echo Lake in the beautiful Qu'Appelle Valley, from the heart of Canada to you.

Watch for it!

Pieter van der Breggen, Proprietor, Dragonfly Writingse.

: RETURN 2200 X=RND(4): ON X GOTO2210,222 0,2230,2240 2210 PRINT@226, "RUMANIAN "; : RETU 2220 PRINT@226, "GREEK ";: RETURN 2230 PRINT@226, "LATIN ";: RETURN 2240 PRINT@226, "FRENCH ";: RETURN

Bonus Listing:

Ø '<STARSONG> 10 '(C) 1984, J. KOLAR 30 PMODE2:PCLS:PMODE4 40 A=170:B=106:P=1.01 50 DIM B(2), D(2), F(2), H(2), J (2)61 DRAW"BM14,0D4" 63 DRAW"BM38,4L4" 65 DRAW"BM54.8U4" 67 DRAW"BM70,4R4" 69 DRAW"BM90,0F2ND4R4NE2D4NF2L4N G2BEU2R2D2L2" 71 GET(10,0)-(18,8),B,G 73 GET(30,0)-(38,8),D,G 75 GET(50,0)-(58,8),F,G 77 GET (70,0) - (78,8),H,G

90 PCLS: SCREEN1.1 105 FOR R=80 TO 20STEP-10 110 FOR Z=2000 TO 1904 STEP-5:C= Z+Z/2 120 C=C+P^2/180 200 X=INT(A-6+R*SIN(C-.625)):Y=I NT (B-6+R*COS (C-.625)) 225 PUT (X-40,Y-10) - (X-32,Y-2).B. NOT 230 PUT(X-40,Y-10)-(X-32,Y-2),D. NOT 235 PUT(X-40,Y-10)-(X-32,Y-2),F. AND 240 PUT(X-40,Y-10)-(X-32,Y-2),H. AND 242 PUT(X-40,Y-10)-(X-32,Y-2),J, PSET: SOUND45, 1: NEXTZ, R 253 FOR S=1TO2:FOR Q=1 TO 5:PUT(124,90)-(132,98),J,PRESET:FORT=1 TO50: NEXT 254 PUT(124,90)-(132,98),J,PSET 256 SOUND10,2:SOUND100,1:NEXTQ 257 FORQ=1T0300:NEXT:PLAY"V20L4E EL8FAFAL16A03CEEC02FAL32FL16AEDL 4CO1BO2CP4V15O2DEGL8GEL16GL8DCEE FFL16GAGL8FEEL2CP4V2ØL4EEFFAAL16 BDL803CECEEDCO2BDL4CO1BL802CL2C" 259 NEXT S 260 GOTO 260 1

UPGRADE NO.

79 GET(90,0)-(98,9),J,G

SPECIAL! SPECIAL! MORE SALE PACKAGES! SUPER SAVINGS...

#5 DRIVE 0 SYSTEM—Includes controller, RSDOS, 40-track slim drive, case, power \$319.95 supply, cable and instructions

#6 WORD PROCESSING PACKAGE—features Silver Reed #400 daisy wheel printer, serial interface plus bonus Telewriter work processing on tape \$398.00

#7 PROGRAMMERS PACKAGE—combines Pasasonic #1090 dot matrix printer serial interface and screen dump program

288.00

#8 GET ON LINE—ideal starter to access those BBS', Volksmodem cables, and terminal program

\$ 84.00

Call for latest prices on Upgrades 1 to 4. Free price list with over 300 Color Computer items, books, kits, disks, cables, and other best buys!



POLYGON COMPUTERS 1316 Wilshire Blvd., Suite 206 Los Angeles, CA 90017



Visit our Retail Store

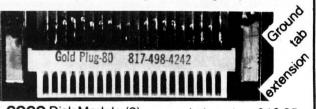
Shipping: \$2 Software Charges: \$5 Hardware

TRS-80+ MOD I, III, COCO, T199/4a TIMEX 1000, OSBORNE, others



GOLD PLUG - 80

Eliminate disk reboots and data loss due to oxidized contacts at the card edge connectors. GOLD PLUG 80 solders to the board edge connector. Use your existing cables. (if gold plated)



COCO Disk Module (2) Ground tab extensions Disk Drives (all R.S.) Gold Disk Cable 2 Drive Four Drive Cable

\$16.95 INCL \$7.95

29.95 39.95

USA shipping \$1.45 Foreign \$7 Don't wait any longer

Can/Mex \$4. **TEXAS 5% TAX**

Available at your favorite dealer or order direct from



E.A.P. CO. P.O. BOX 14



KELLER, TEXAS 76248

(817) 498-4242

MC/VISA

+ trademark Tandy Corp

HARDWARE & PROGRAMS

MONITORS

BMC MEDIUM-RES COLOR

13" BMC w/ sound				 \$303.95
14" USI w/ sound .	*			 . 324.95
12" Taxon Composi				

COMREX HI-RES MONOCHROME

12" Amber or Green	140.9
9" Amber or Green	125.9
Sorry, no C.O.D. on	monitors

COMPOSITE MONITOR INTERFACES

Double Driver24,9	15
Video Plus24.9	
Both work great with color	
or monochrome on CoCo I	

Coco Double Drive	er	28.95
Video Plus II M		26.95
Video Plus II C		39.95
For CoCo	o II Only	

JARB DISK DOUBLER

Why spend twice as much as you need to for double sided diskettes? With our doubler, you can make your own and pay for it with the first box you double. A must for disk drive users.

BASF DATA CASSETTES

	C-05	C-10
1-10	.60 ea.	.65 ca.
11-20	.55 ea.	.60 ea.
Soft Poly C	ases	Ea. 5.20
	ed Cases	
Cassette La	bels (12)	Sh. \$.36
Cassette La	bels Tractor (100)	11 \$21.95

MEMORY UPGRADE KITS

16K RAM	CHIPS	 1	.50 ea
5V, CoCo	II 16K .	 	1.95 ca.

'64K RAM CHIPS

Eight 200 NS Factory Prime 64K RAM Chips. Allows you to upgrade 'all' board easily. No soldering needed. \$52.50

'16K/32K

Eight 200 NS Factory Prime Chips with Piggy Backed Sockets, Sam Socket, Bus Wire. Comprehensive Instructions. Recommended for "D" or earlier, but may be used on "E". Only 9 simple solder connections to kit. None to computer. \$25.95 NOT FOR CoCo 2



BY Terry A. Steen

An excellent hi-res, arcade quality game program for two players. Joysticks and 32K are required in this all machine language program.

Cassette . \$19.95 Disk/Amdisk . \$24.95

JUNGLE TREK

Lost in a jungle with wild animals lurking; your only survival is to find a safe compound before you are lunch for lions; high resolution; multi-color.

16K EXT.....\$14.95

BIORHYTHM/PSYCHIC APT.

- 1) Prints biorhythm charts of nearly unlimited length; attractively formatted for use on most printers.
- 2) Your psychic ability is determined through questions evaluating your psychic experiences

16K Ext Both for \$15.95

PROGRAMS FOR THE SPECTRUM PROJECTS VOICE-PAK OR SPEECH SYSTEMS VOICE

TALKING FINAL COUNTDOWN

(by Bill Cook)

For 32K EXT	. \$19.95
Standard cassette	
FINAL COUNTDOWN	. \$14.95

TALKING SPELL-A-TRON

The program allows the user to build a dictionary of words. During testing, the words are spoken. If an incorrect response is given, the word is spoken again and spelled. Tape (32K EXT) \$22.95

TALKING SCORE E-Z

A yahtzee type program. Up to six players
can compete. All scoring and record keep-
ing is done by the computer. Tape (32K
EXT)
Standard SCORE E-Z\$15.95

TALKING COLOR MATH

The perfect educational game to aid the student in learning addition, subtraction, multiplication and division. Allows one to specify difficulty level.

Tape (32K EXT)\$22.95

TALKING SHIP HUNT

by Cobra Software

Play Battleship against your computer. 32K w/ joystick needed. Graphics and sound. Can be played without voice. Cassette\$10.95

SCHEMATIC DRAFTING PROCESSOR (disk) can draw large scale schematics in hi-res (has six overlapping screens) and then print them out to any of several popular printers, fast!! A must for serious hardware computerist.

Now only......\$49.95

CoCo Chips

Sam, Pia, CPU, Ext, Basic

We carry products from many manufacturers. If you don't see it, ask.

SOFTWARE

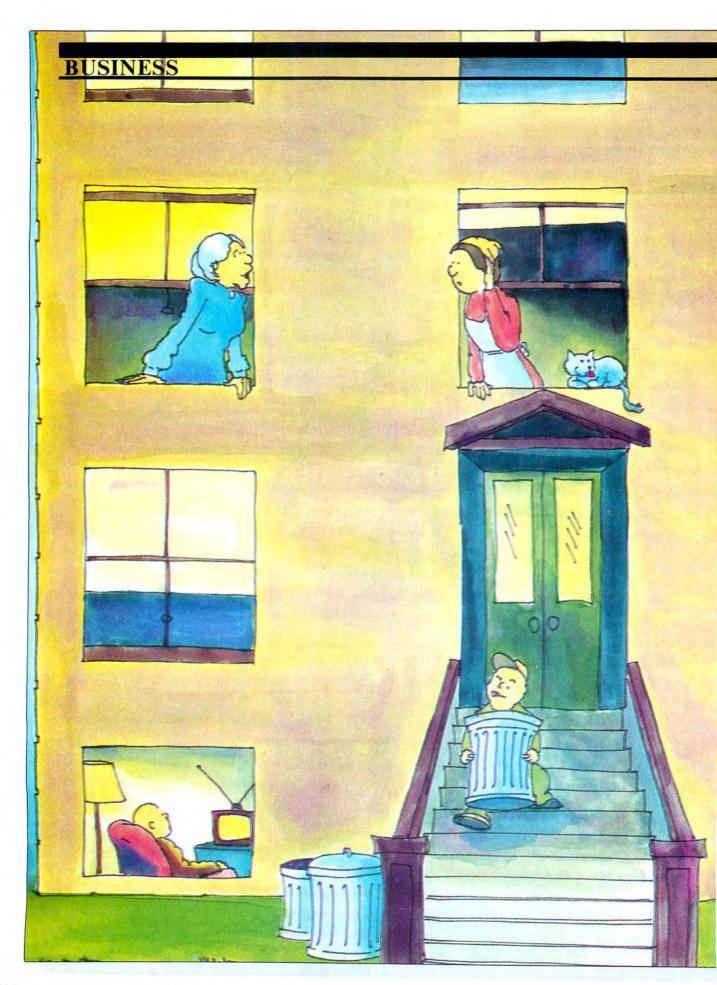
HARDWARE

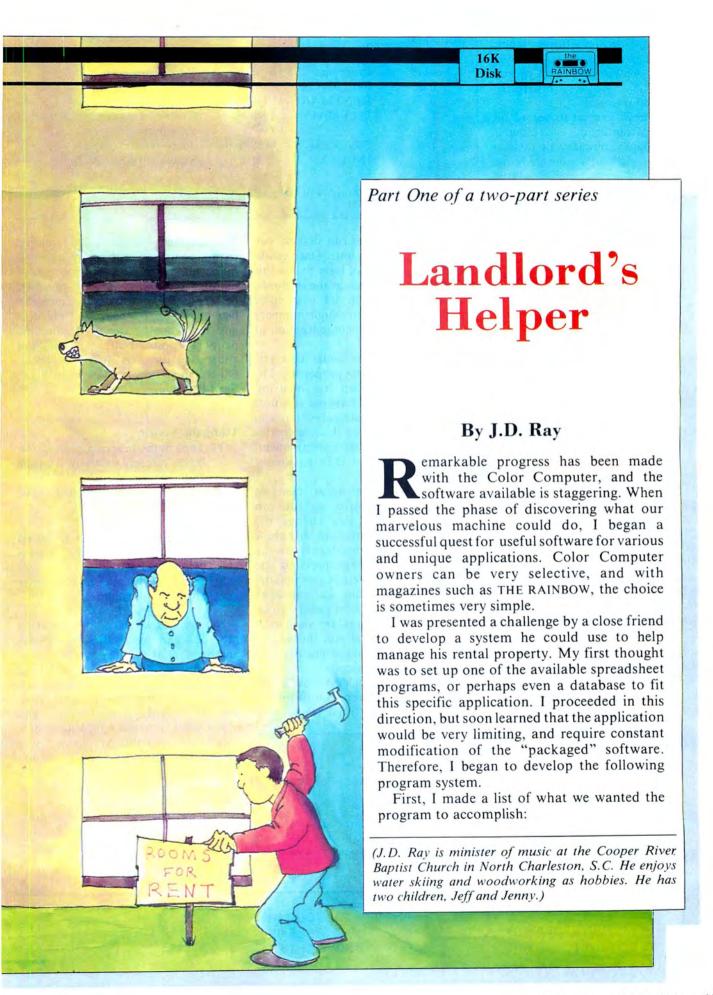
COD orders accepted, no charge cards please. Shipping and handling \$3.00 California residents please add 6% sales tax

Order Line (619) 474-8982

After Hours BBS (619) 474-8981

1636 D Avenue, Suite C National City, CA 92050





- A file program to have pertinent information available when needed, such as renter's name, rental date, deposits, phone numbers and mortgage information.
- 2) A financial journal to record all financial transactions each month.
- 3) A financial summary of income and expenses on a monthly basis.
- A financial summary of individual property transactions on a monthly basis.
- A year-to-date summary on income and expenses.
- 6) Applicable on a 16K Disk System with printer options.
- Sufficient screen prompts to prevent keeping paper notes and instructions.

We soon discovered that one program would be too cumbersome and too large for even a 32K system. I developed the system using four different programs to perform the various functions. A menu program coordinates the entire system.

Program Summary

RENTMENU sets up the basic foundation of the system and allows you to enter any special commands that will be needed for the other programs. Since graphics are not needed, a PCLEAR1 is added to take advantage of all available memory. This will be especially important to 16K users. You can also insert commands to alter your printer Baud rate. Once the Baud rate is set in the menu program, you do not have to set it again in the other four programs.

FILEMAIN is a file maintenance program and allows you to set up the programs for your own needs. This

Listing	Program	Size	Purpose
1	RENTMENU	636 bytes	System Manager
2	RENTMANG	5838 bytes	Property Information
3	FILEMAIN	4348 bytes	Codes, Income/Expense Accounts
4	TRANSACT	3787 bytes	Transaction Journal
5	INCOEXP	6811 bytes	Statements/Summaries

program needs to be run first so you can set up your accounts. Once established, you should not have to run this program except to change the accounts. The first menu will let you enter property codes (a three-digit number/letter combination), income accounts or expense accounts.

Property codes are codes that you assign to your various properties. The codes can be set up by location, acquisition or value. Expense accounts are those expense categories that you determine will be used. Use categories such as maintenance, advertisement, utilities, mortgage or loan payments, etc.

I advise you to set up at least two miscellaneous categories so you can expand later. You can change the account names at any time, and these will be reflected immediately in the program. However, the previous file summaries will not reflect this update. Be careful when adding accounts after the program has been in use for some time. Income accounts are similar to expense accounts and you should use such categories as rent income, refunds, deposits and miscellaneous.

RENT MANAGEMENT is a file program set up to keep records on the properties that you listed in the File

Maintenance Program. Information requested will be such things as rental date, phone number, deposit paid, monthly rent, purchase date, purchase price, monthly mortgage, due date and lien holder. These can be changed at any time, but be sure to change the property code, renter's name and address in the *FILEMAIN* program. Other items can be changed at any time. See Illustration 1.

Using the System

- Type in the program carefully, or better yet, buy RAINBOW ON TAPE and save your fingers.
- All programs must be on the same disk.
- Type Run 'RENTMENU'
- Select Menu option 4 to set up property codes, income and expense accounts.
- 5) Select Menu option 1 to enter property information.

Next month we will add the financial programs and discuss the use of Direct and Sequential disk files. Because these programs are set up to use disk files only, a cassette system will not work without radical system changes. While you are waiting for next month, you might want to brush up on using disk files by reading Bill Nolan's series of articles found in the July-December 1984 issues of THE RAINBOW. This system will be available on disk for \$10 plus a disk and return postage. This system has been set up for two drive systems and for some of the high resolution screens. If interested, contact me at 5065 France Avenue in North Charleston, SC 29406.

lustration 1		
Ren	ital Property Informa	tion
	PROPERTY NO: 444	
	DATE: 12/31/84	
ADDRESS: 5000 LAKEVIEW DR	HANAHAN	SC 29406
American Marines States		Andrew Market Control
RENTER: STEVE DAVIS	PHONE: 323-4343	RENTAL DATE: 11/01/82
MONTHLY RENT: \$200.00	DEPOSIT: \$200.00	
PUR. DATE: 02/15/81 PUR. F	PRICE: \$25,000.00	MONTHLY MORTGAGE: \$300.00
LIEN HOLDER: FIRST FEDERAL SA	AVING	DUE: 25th

Listing 1:

- 10 '**** RENT MENU ****
- 20 'LISTING #1

- 30 'COPYRIGHT- J.D. RAY
- 40 PCLEAR1
- 50 CC=163:DD=200:FOR XX=1TO6

The JBM Group brings you OS-9* SOFTWARE SOLUTIONS!

NuBASE: The uncomplicated data base \$1

At last- a data base manager so versatile that you can use it to do what *you* want with your data. It's not complicated or overbearing; in fact, it's so easy to use that you'll be up and running in minutes.

Simple, user-specified masks insure data accuracy. Data integrity is assured through the use of highly crash-resistant software. *See* what you're doing through the interactive generation of screens, files and reports. NuBASE is as affordable as it is complete. There's nothing else to buy; one price brings you the

NuBASE is as affordable as it is complete. There's nothing else to buy; one price brings you the comprehensive package, including a ready-to-use mailing list application to get your NuBASE working for you on day one.

CAL

\$69

Appointment calendar program to help keep your important dates straight.

- Simple command structure
- · Lists appointments by day, week or month
- Revises dates, times, relevant information on existing schedule entries
- Default calendar file for each user
- Unlimited alternate calendar files
- System-wide master file for scheduling common appointments

GENUS

\$49

A new stand-alone sort for OS-9 that keeps asking for more data!

- Easy-to-understand prompts ask you for all information necessary to sort your data files
- · Allows sorting in ascending or descending order
- Allows unlimited number of sort keys of different types
- Saves both disk and memory space by summing numeric fields as it sorts

DISK BACKUP

\$99

Controlled hard disk-to-floppy backup with restore capability

- Handles files larger than output media
- Single file, Wild Card search, current directory only, current-and-all-subdirectories
- Date and time for incremental backup
- Operator-friendly, handles error conditions smoothly
- · Use to create optimized disks





*OS-9 is a registered trademark of Microware Corporation

HELP

\$69

User-expandable generic help facility

- Includes data for online help with OS-9 utilities
- Fast, efficient disk storage
- Three-level nesting Wild Card searching
- Automatic display of available help
- Steps the user until he finds the answer

THE MESSAGE

\$89

The only interoffice memo system currently available for OS-9 Level II users.

- Eliminates lost and confused interoffice memos
- Interfaces easily with your existing word processor or editor; no new commands needed
- Allows hardcopy printout, verification of received messages, immediate reply to sender
- Transmit new messages OR existing files to single user, or 'broadcast' to all users
- Preview Line indicates number, size and topic of stored messages
- Saves time, money, energy; cuts down on 'office aggravation'

For more information or to place an order, contact:

Dept. RB 17

The JBM Group, Inc.

Continental Business Center Front & Ford Streets Bridgeport, PA 19405

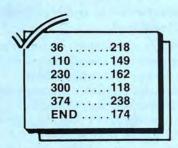


TWX: 510-660-3999

215-275-1777

PA res. add 6% sales tax. US orders, add \$5.00 postage and handling.

60 CLS6 70 PRINT@CC, "RENTAL PROPERTY MAN AGEMENT": BØ PRINT@DD, "(C) BY J. D. RAY"; 90 CC=CC-32 100 FOR Z=1T0250: NEXTZ 110 NEXTXX 120 'INSERT PRINTER BAUD RATE 130 PRINT@107, "MAIN MENU: "; 140 PRINT@162,"1) PROPERTY INFOR MATION": 150 PRINT@194,"2) LIST MONTHLY T RANSACTIONS": 160 PRINT@226, "3) INCOME/EXPENSE SUMMARY"; 170 PRINT@258,"4) SET-UP ACCOUNT 5"; 180 PRINT@290,"5) END JOB"; 190 PRINT@390,"(1, 2, 3, 4, OR 5) "; 200 AN\$=INKEY\$ 210 IF AN\$=""THEN200 220 ON VAL(AN\$) GOSUB240,250,260 ,270,280 230 GOTO 130 240 RUN"RENTMANG" 250 RUN"TRANSACT" 260 RUN"INCOEXP" 270 RUN"FILEMAIN" 280 POKE113,0:EXEC40999



Listing 2:

2 '***RENTMANG*** 4 **PROPERTY INFORMATION** 6 'LISTING #2 8 CC=163:FOR XX=1 TO 6 10 CLS:PRINT@CC, "RENTAL PROPERTY INFORMATION" 12 CC=CC-32 14 FOR Z=1T0250: NEXTZ 16 NEXTXX 18 CLEAR1000:DIM MTH\$(12) 20 FOR ZZ=1 TO 12:READ MTH\$(ZZ): NEXTZZ 22 DATA JANUARY, FEBRUARY, MARCH, MAY, JUNE, JULY, AUGU APRIL. ST, SEPTEMBER, OCTOBER, NOVEMBER, DE 24 K\$="\$##,###.##":K1\$="\$\$###,## #.##":KK\$="\$\$####.##"

26 X=Ø 28 OPEN"I",#1,"PROPERTY/ACC" 30 IF EOF(1)=-1 THEN CLOSE#1:GOT 32 X = X + 134 INPUT#1,COD\$(X),ADR\$(X),NAM\$(X) 36 GOTO30 38 CLOSE#1 40 IF X=0 THEN CLS:PRINT:PRINT"Y OU NEED TO INPUT PROPERTY NFORMATION FIRST!" 42 CLS: PRINT@98, "RENTAL PROPERTY INFORMATION" 44 PRINT@162,"1) INPUT DATA" 46 PRINT@194,"2) VIEW DATA" 48 PRINT@226, "3) PRINT DATA": PRI NT@258,"4) END THIS JOB" 50 PRINT@322,"(1, 2, 3, OR 4)" 52 AN\$=INKEY\$: IF AN\$=""THEN52 54 ON VAL (AN\$) GOSUB 56,156,352, 408 56 'SUBROUTINE TO INPUT DATA ON DISK 58 CLS:FORJJ=1TO5:PRINT:NEXT:PRI NT" ENTER TODAY'S DATE: (MM/DD/Y Y) " ": U\$ 60 PRINT: INPUT" 62 GOSUB410 64 REC = LOF(1)66 REC = REC+1 68 CLS: PRINT @3, "RENTAL PROPERTY INFORMATION" 70 PRINT 72 P\$=COD\$(REC):PRINT"PROPERTY N O. CODE: ":P\$ 74 A\$=ADR\$(REC):PRINT"ADDRESS: " : A\$ 76 INPUT"CITY: ";C\$ 78 INPUT"STATE (XX): ";S\$ 80 INPUT"ZIP CODE (XXXXX): ";Z\$ 82 N\$=NAM\$(REC):PRINT"RENTER NAM E: "; N\$ 84 INPUT"RENTAL DATE (MM/DD/YY): B6 INPUT"PHONE (XXX-XXXX): ";H\$ 88 INPUT"DEPOSIT PAID: ":D(REC) 90 INPUT "MONTHLY RENT: "; M (REC) 92 INPUT"PUR DATE (MM/DD/YY):":E 94 INPUT"PURCHASE PRICE: ";PRI(R EC) 96 INPUT"MONTHLY MORT.: \$";Q(REC 98 INPUT"LIEN HOLDER: ":LN\$ 100 INPUT"PAYMENT DUE: (XX) ":PY 102 LSET UDAT\$=U\$ 104 LSET COD\$=P\$

106 LSET ADR\$=A\$	156 'SUBROUTINE FOR VIEWING INFO
108 LSET CITY\$=C\$	RMATION FILES
110 LSET STAT\$=S\$	158 CLOSE#1
112 LSET ZIP\$=Z\$	160 GOSUB 410
114 LSET NAMES=NS	162 CLS:PRINT@160,"DO YOU WANT T
116 LSET RDAT\$=R\$	O SEE ALL FILES OR ONE PROPERTY
118 LSET PHON\$=H\$	LOCATION? "
120 LSET DEP\$=MKN\$(D(REC))	164 PRINT@224,"(aLL DR oNE)"
122 LSET MREN\$=MKN\$(M(REC))	166 INPUT XX\$
124 LSET PUR\$=E\$	168 IF XX\$="O"THEN PRINT:PRINT"W
126 LSET PRIC\$=MKN\$(PRI(REC))	HAT IS THE PROPERTY NO. (XXX): "
128 LSET MORT\$=MKN\$(Q(REC))	:INPUT MN\$
130 LSET LIEN\$=LN\$	170 FOR REC = 1 TO LOF(1)
132 LSET PAY\$=PY\$	172 GET #1,REC
134 PUT #1,REC	174 PRI(REC)=CVN(PRIC\$)
136 IF TAG\$="YES"THEN184	176 M(REC)=CVN(MREN\$)
138 IF REC=X THEN GOTO42	178 D(REC)=CVN(DEP\$)
140 CLS:PRINT@162,"1) INPUT ANOT	180 Q(REC)=CVN(MORT\$)
HER FILE"	182 IF XX\$="O" AND COD\$ <> MN\$ T
142 PRINT@194,"2) VIEW INFORMATI	HEN 224
ON"	184 CLS
144 PRINT@226,"3) CHANGE INFORMA	186 TAG\$="NO"
TION"	188 PRINT@2, "rental property inf
146 PRINT@258,"4) END THIS JOB"	ormation"
148 PRINT@394,"(1, 2, 3, OR 4)"	190 PRINT: PRINT@64, "prop. #: ";C
150 AN\$=INKEY\$: IF AN\$=""THEN150	OD\$
152 ON VAL (AN\$) GOSUB 66,156,230	192 PRINT@80,"date: ";UDAT\$
,416	194 PRINT@96, "address: "; ADR\$
154 GOTO 140	196 PRINT@137,CITY\$;:PRINT@149,"



ABC'S In Color

Speed your child's learning of the Alphabet! CoCo 16K ECB Tape \$19.95 Disk \$25.95

Alpha Memory Your child can master the lower and upper case letters of the alphabet while having fun!

Tape \$16.95 CoCo 16K

Mr. Bear Count

A counting program that will tantalize the youngest member of your family! CoCo 16K Tape \$15.95 Disk \$19.95

Mr. Bear Math

Add & subtract with Mr. Bear. Your child will gain Mr. Bear's wink of praise & approval!

Tape \$15.95 Disk \$19.95 CoCo 16K

Over 75 Titles!

Basic Math

Learn to add & subtract through

CoCo 16K ECB Tape \$12.95 Disk \$16.95

Mix & Match

A brilliantly colored constantly moving computer version of concentration! CoCo 16K Tape \$12.95 Disk \$16.95



Mr. Bear Flash Card

After your child has mastered Mr. Bear Math, continue his/her learning, experience with Mr. Bear's multiplication & division flash card. CoCo 16K Tape \$15.95 Disk \$19.95

Mr. Piggy

Program will aid your child in learning the value of money! CoCo 32K ECB Tape \$19.95 Disk \$24.95 See & Spell

Let your computer aid your child in learning to spell! CoCo 16K ECB Tape \$14.95 Disk \$18.95

Teaching Clock

Learn to tell time with the aid of a special teaching clock! CoCo 16K ECB Tape \$16.95 Disk \$19.95

ograms Have Been Child, Parent, & Educator Tested

FREE Catalog

P.O. BOX 2477 GAITHERSBURG, MD 20879

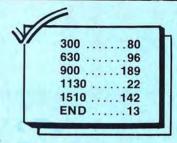




```
":STAT$:" ":ZIP$
                                     78
198 PRINT:PRINT@192, "renter: ";N
                                     276 N$=NAME$
                                     278 PRINT@64, "PHONE NO.: "; PHON$
                                     : GOSUB344
200 PRINT@224, "phone no.: "; PHON
                                     280 IF AT$="Y"THEN282ELSE284
202 PRINT@256, "rental date: ";RD
                                     282 INPUT"NEW PHONE NO.: ";H$:GO
                                     T0286
AT#
                                     284 H$=PHON$
204 PRINT@288, "rent: $"; M(REC);:
                                     286 PRINT@64, "RENTAL DATE: "; RDA
PRINT@302, "deposit: $"; D(REC)
206 PRINT:PRINT@321, "purchase da
                                     T$: GOSUB344
te: "; PUR$
                                     288 IF AT$="Y"THEN290ELSE292
                                     290 INPUT"NEW RENTAL DATE: ";R$:
208 PRINT@353, "purchase price: $
                                     G0T0294
";PRI(REC)
                                     292 R$=RDAT$
210 PRINT@384, "monthly mort.: $"
;Q(REC);:PRINT" due: ";PAY$;"th
                                     294 PRINT@64, "MONTHLY RENT: ";M(
                                     REC): GOSUB344
                                     296 IF AT$="Y"THEN298ELSE300
212 PRINT@416, "lien holder: ";LI
EN#
                                     298 INPUT"NEW MONTHLY RENT: ";M(
214 PRINT@482, "PRESS nEXT, mENU,
                                     REC): GOT0300
                                     300 PRINT@64, "DEPOSIT: "; D(REC):
OR CHANGE":
216 ANS$=INKEY$
                                     GOSUB344
                                     302 IF AT$="Y"THEN304ELSE306
218 IF ANS$="N" THEN 224
220 IF ANS$="C"THEN 230
                                     304 INPUT"NEW DEPOSIT: ";D(REC):
222 IF ANS$="M"THEN 226 ELSE 214
                                     GOT0306
224 NEXT REC
                                     306 PRINT@64, "PURCHASE DATE: ":P
226 CLOSE#1
                                     UR$: GOSUB344
228 GOTO 42
                                     308 IF AT$="Y"THEN310ELSE312
                                     310 INPUT"NEW PURCHASE DATE: ":E
230 'SUBROUTINE TO CHANGE DATA
232 TAG$="YES"
                                     $:GOTO314
234 CLS:PRINT@64, "PROPERTY NO.:
                                     312 E#=PUR#
                                     314 PRINT@64, "PURCHASE PRICE: ":
"; COD$: GOSUB344
236 IF AT$="Y"THEN238ELSE240
                                     PRI (REC): GOSUB344
                                     316 IF AT$="Y"THEN 318ELSE320
238 INPUT"NEW PROPERTY NO.: ";P$
                                     318 INPUT"NEW PURCHASE PRICE: ";
:GOTO242
                                     PRI (REC)
240 P$=COD$
242 PRINT@64, "DATE: "; UDAT$: GOSU
                                     320 PRINT@64, "MONTHLY MORTGAGE:
                                     ";Q(REC):GOSUB344
244 IF AT$="Y"THEN246ELSE248
                                     322 IF AT$="Y"THEN324ELSE326
246 INPUT"NEW DATE: ";U$:GOTO250
                                     324 INPUT"NEW MORTGAGE: ":Q(REC)
248 U$=UDAT$
                                     : GOTO326
250 PRINT@64, "ADDRESS: ":ADR$:GO
                                     326 PRINT@64, "LIEN HOLD: "; LIEN$:
                                     GOSUB344
SUB344
                                     328 IF AT$="Y"THEN330ELSE332
252 IF AT$="Y"THEN254ELSE256
                                     330 INPUT"NEW LIEN HOLDER: "; LN$
254 INPUT"NEW ADDRESS: "; A$: GOTO
258
                                     : GOTO334
                                     332 LN#=LIEN#
256 A$=ADR$
258 PRINT@64, CITY#; " "; STAT#; " "
                                     334 PRINT@64, "DATE DUE: "; PAY$:G
                                     OSUB344
: ZIP#: GOSUB344
                                     336 IF AT$="Y"THEN338ELSE340
260 IF AT$="Y"THEN262ELSE264
262 INPUT"NEW CITY: ":C$:INPUT"N
                                     338 INPUT"NEW DUE DATE: "; PY$:GO
                                     T0342
EW STATE: ";S$: INPUT"NEW ZIP: ":
                                     340 PY$=PAY$
Z$: GOTO270
264 C$=CITY$
                                     342 GOTO102
                                     344 PRINT: PRINT: PRINT "CHANGE? (Y
266 S$=STAT$
                                     /N) "
268 Z$=ZIP$
270 PRINT@64, "RENTER: "; NAME$:GO
                                     346 AT$=INKEY$: IF AT$=""THEN346
                                     348 PRINT
SUB344
                                     350 RETURN
272 IF AT$="Y"THEN274ELSE276
                                     352 'SUBROUTINE TO PRINT INFORMA
274 INPUT"NEW RENTER: ";N$:GOTO2
```

TION 354 GOSUB410 356 CLS:PRINT@160,"DO YOU WANT T O PRINT ALL FILE OR JUST ONE PRO PERTY LOCATION? ": PRINT@224," (AL L OR ONE)" 358 INPUT XX\$ 360 IF XX\$="O"THEN PRINT:PRINT"W HAT IS THE PROPERTY NO. (XXX): " : INPUT MN\$ 362 FOR REC=1 TO LOF(1) 364 GET #1,REC 366 PRI(REC)=CVN(PRIC\$) 368 M(REC)=CVN(MREN\$) 370 D(REC)=CVN(DEP\$) 372 Q(REC)=CVN(MORT\$) 374 IF XX\$="0" AND COD\$ <> MN\$ T HEN 402 376 FORX=1TO3:PRINT#-2:NEXTX 378 PRINT#-2, TAB(26); "Rental Pro perty Information" 380 PRINT#-2, TAB(30); "PROPERTY N ": COD\$ 382 PRINT#-2, TAB(32); "DATE: ";U DAT\$ 384 PRINT#-2:PRINT#-2 386 PRINT#-2, "ADDRESS: "; ADR\$; " ";CITY\$;", ";STAT\$;" :ZIP\$ 388 PRINT#-2 390 PRINT#-2, "RENTER: "; NAME\$; T "; PHON\$; " AB(8); "PHONE: "; "RENTAL DATE: "; RDAT\$ 392 PRINT#-2, "MONTHLY RENT: ";:P RINT#-2,USINGKK\$; M(REC); : PRINT#-"; "DEPOSIT: 2," ";:PRINT#-2.USINGKK*: D(REC) 394 PRINT#-2 396 PRINT#-2, "PUR. DATE: "; PUR\$ "; "PUR. PRICE: "::PRINT#-2 .USINGK1\$;PRI(REC); 398 PRINT#-2," MONTHLY MORTGAG ";:PRINT#-2,USINGKK\$;Q(REC) 400 PRINT#-2,"LIEN HOLDER: ";LIE "; PAY N\$: " DUE: \$; "th" 402 NEXT REC 404 CLOSE#1 406 GOTO42 408 RUN"RENTMENU" 410 OPEN"D",#1,"RENTAL/DAT",145 412 FIELD#1,3 AS COD\$,8 AS UDAT\$,20 AS ADR\$,15 AS CITY\$,2 AS STA T\$,5 AS ZIP\$,20 AS NAME\$,8 AS PH ON\$,8 AS RDAT\$,6 AS MREN\$,6 AS D EP\$,8 AS PUR\$,8 AS PRIC\$,6 AS MO RT\$,20 AS LIEN\$,2 AS PAY\$ 414 RETURN

416 GOTO42



Listing 3:

10 ***FILEMAIN*** ***FILE MAINTENANCE PROGRAM** 20 30 'LISTING #3 40 CLEAR 1000 50 CC=164:FOR XX=1 TO 6 60 CLS 70 PRINT@CC, "FILE MAINTENANCE PR OGRAM" 80 CC=CC-32 90 FOR Z=1T0300:NEXTZ 100 NEXT XX 110 PRINT@107, "SELECTIONS: 120 PRINT@162,"1) PROPERTY CODES 130 PRINT@194,"2) EXPENSE ACCOUN TS" 140 PRINT@226, "3) INCOME ACCOUNT





here but at **RAINBOWfest** could you meet so many CoCo enthusiasts, see so many new products, and attend seminars that are of immediate assistance? It's the next best thing to receiving the latest issue of THE RAINBOW in your mailbox.

Many of the people who write for THE RAINBOW — and those who are written about — are there to meet you and answer your questions, technical and otherwise. **RAINBOWfest** is CoCo's very own show, and it's a people-to-people event as well as a valuable learning experience.

To make it easier for you to attend, we schedule **RAINBOWfest** in three parts of the country. If you missed the fun in Irvine, Calif., why don't you make plans now to be with us in Chicago, Ill., or New Brunswick, N.J.? Each show is unique, offering fun, new acquaintances, and great sharing experiences. For members of the family who don't share your affinity for CoCo, you'll be comfortable knowing that each **RAINBOWfest** is located in an area that will provide fun and enjoyment for all.

Our Chicago show is being held at the Hyatt Regency Schaumburg, adjacent to

— Chicago
May 17-19, 1985
Hyatt Regency Schaumburg
\$65 per night, single or double
May 10, 1985

— New Brunswick, N.J.
October 18-20, 1985
Hyatt Regency
\$65 per night, single or double
October 11, 1985

the Woodfield Mall, one of the largest indoor shopping centers in the world. The Hyatt Regency offers special rates for **RAINBOWfest**. The show opens Friday evening with a 7 p.m. to 10 p.m. session. It's a daytime-only show Saturday — the CoCo Community Breakfast is at 8 a.m., then the exhibit hall opens promptly at 10 a.m. and runs continuously until 6 p.m. There will be no exhibition hours or seminars Saturday evening. On Sunday, the exhibit hall opens at 11 a.m. and closes at 4 p.m.

A well-known speaker will again keynote the highly popular CoCo Community Breakfast. And you can set your own pace in the exhibit hall interspaced with a number of seminar sessions on all aspects of CoCo — from improving your BASIC skills to working with the OS-9 system.

But most of all, there will be exhibitors. Lots of them. All ready to demonstrate products of every kind. It's a time for unveiling brand new products. Many have special buys for **RAINBOWfest**. If you've been eyeing something in THE RAINBOW, you can try it out and take it home that very day.

Tickets may be obtained directly from THE RAINBOW. We'll also send you a special reservation form so you can get your special room rate.

Come to **RAINBOWfest**. Let's all celebrate the CoCo Community!

United Airlines and THE RAINBOW have joined together to offer a special discounted fare to those attending **RAINBOWfest** Chicago. Simply by calling United at the toll free number listed below and identifying our meeting, with account number 563-E, you will be eligible for a 20 percent discount on the Easy Saver Fare. The only requirement is a Saturday evening stay.

(800) 521-4041 Account Number 563-E

Show Schedule:

Friday evening — Exhibit hall open from 7 p.m. to 10 p.m.

Saturday — CoCo Community Breakfast at 8 a.m. Exhibit Hall opens at 10 a.m. and closes at 6 p.m. Sunday — Exhibit Hall open from 11 a.m. to 4 p.m.

FREE T-Shirt to first five ticket orders received from each state.

Make checks payable to: THE RAINBOW

MAIL TO:

RAINBOWfest P.O. BOX 385 Prospect, KY 40059 (502) 228-4492

YES, I'm coming to <i>RAINBOWfest</i> ! I want to save by buying tickets now at the special advance sale price. Send me tickets for (check one):
Chicago, Illinois New Brunswick, N.J.
Please send me:
three day tickets at \$9 each one day tickets at \$7 each Circle one: Friday / Saturday / Sunday Saturday breakfast tickets at \$12 each Handling Charge \$1
TOTAL ENCLOSED (U.S. FUNDS ONLY, PLEASE) \$
Also send me a hotel reservation card for () Chicago, or () New Brunswick.
NAME (please print).
STREET & NUMBER
CITY & STATE
TELEPHONE ZIP CODE
COMPANY
Orders received less than two weeks prior to show opening will be held for you at the door.
VISA, MasterCard, American Express accepted.
My Account # Ex. Date:
Signature

160 PRINT@394,"(1, 2, 3 OR 4)" 170 AT\$=INKEY\$: IF AT\$=""THEN170 180 ON VAL(AT\$) GOSUB 190,730,12 60,1810 190 'PROPERTY CODES 200 CLS: PRINT@9, "PROPERTY CODES" 210 GOSUB 780 220 ON VAL(AT\$) GOSUB 240,400,49 0,1240 230 GOTO210 240 'INPUT CODES 250 CLS:PRINT"PREVIOUSLY ENTERED CODES WILL BE LOST 1 1 11 260 PRINT"DO YOU WANT TO CONTINU E (Y/N)": INPUT AZ\$ 270 IF AZ\$="N"THEN780 280 X=0:CLS:OPEN"O",#1,"PROPERTY /ACC" 290 CLS: PRINT" PRESS (ENTER) WHE N FINISHED": PRINT 300 X=X+1 310 INPUT" PROPERTY CODE: "; COD\$ (X) 320 IF COD\$(X)="" THEN CLOSE#1:G OT0190 330 IF LEN(COD\$(X))>3 THEN PRINT TOO LONG!! REDO ":GOTO320 340 INPUT" ADDRESS: ";ADR\$(X)

THE SOFTWARE





DATA GRADE TAPE

(with labels)

C-10 \$6.95/Doz. 25/\$13.95 C-20 \$8.50/Doz. 25/\$15.95 C-30 \$9.95/Doz. 25/\$17.95

"SPESHUL"

(15 Tapes, Hard Boxes, Labels and Storage Box) C-10 \$12.95 C-20 \$13.95 C-30 \$14.95

Hard Roxes 25/\$4 50-100/\$15 00

Cass.Labels \$275/100 \$20 00/1000

MEDIA MATE Disk Bank - Holds 50 Disks

DISK DRIVE HEAD CLEANER RIBBONS:

EPSON MX/FX/RX 70/80 6/\$39.95 \$6.95 ea. Red, Green, Blue, Brown \$7.95 ea. 4/\$28.00 Gemini 10, 10X 2/\$5.50 Doz./\$29.95 2/\$5.50 Okidata 80, 82, 92, 93 Doz./\$29.95 **GEM/OKI Colors** \$3.50 ea. Okidata 84, 94 \$6.00 ea

ALL ITEMS 100% GUARANTEED!

.... in Mich. add 4% sales tax. Add \$2.50 for s/h. Make check or money order payable to:

"DALLAS COX"

9020 Hemingway, Redford, MI 48239

(313) 937-3442

Clubs & Dealers - Call for quantity prices

VISA

Send card number & expiration date. Minimum order \$20.00

350 IF LEN(ADR\$(X))>20 THEN PRIN TOO LONG!! REDO ": GOTO340 T" 36Ø INPUT" RENTER: ":NAM\$(X):PRI NT 370 IF LEN(NAM\$(X))>20 THEN PRIN TOO LONG!! REDO ": GOTO360 380 WRITE #1, COD\$(X), ADR\$(X), NA M\$(X) 390 GOTO 300 'VIEW ACCOUNTS 400 PROPE 410 X=0:CLS:PRINT" RTY CODES":PRINT 420 OPEN"I",#1,"PROPERTY/ACC" 430 IF EOF(1)=-1 THEN CLOSE#1:EX EC44539: GOTO190 44Ø X=X+1 450 INPUT#1,COD\$(X),ADR\$(X),NAM\$ (X) 460 PRINTCOD\$(X); " "; NAM\$(X) ": ADR\$(X) 470 PRINT" 480 GOTO 430 'CHANGE ACCOUNTS 500 X=0:CLS:OPEN"I",#1,"PROPERTY /ACC" 510 OPEN"O",#2,"TEMP/ACC" 520 IF EOF(1)=-1 THEN 650 530 X=X+1 540 INPUT#1,COD\$(X),ADR\$(X),NAM\$ (X) 550 CLS:PRINT@64,CDD\$(X);" AM#(X) 560 PRINT" ": ADR\$(X) 570 GOSUB1580 580 ON VAL(Q2\$) GOSUB 600,520,63 590 GOTO 570 600 INPUT" NEW PROPERTY CODE: "; COD\$(X) 610 INPUT" NEW ADDRESS: ":ADR\$(X 620 INPUT" NEW RENTER: ":NAM\$(X) 630 WRITE#2,COD\$(X),ADR\$(X),NAM\$

"; N

SENTINEL BRAND

100% Certified Disks SS/DD Box of 10 \$18.95 Box of 10 \$24.95 DS/DD Box of 10 \$25.95 SS/96TPI DS/96TPI Box of 10 \$29.95

SENTINEL Bulk Disks W/Tyvek 10/\$14.95 - 50/\$70.00 SS/DD 10/\$18.95 - 50/\$90.00 DS/DD

COSMOS DISKS

(Our Own Brand Label) Certified 100% Error Free 10/\$12.95 50/\$60.00 SS/DD DS/DD 10/\$14.95 50/\$70.00 Tyvek Sleeves 15/\$2.00-100/\$10.00

\$8.95

480 GOTO 400 690 CLOSE#2,#1 4/\$12.00 700 KILL"PROPERTY/ACC" 6/\$30.00 710 RENAME "TEMP/ACC" TO "PROPERTY/

720 GOTO190

ACC"

670 X=X+1

640 GOT0520

DD A PROPERTY

(X)

EXPENSE ACCOUNTS 730

660 IF Q3\$="N"THEN 690

740 CLS:PRINT@9, "EXPENSE ACCOUNT 5"

650 PRINT: INPUT"DO YOU WISH TO A

(Y/N)": Q3\$

750 GOSUB780

760 ON VAL (AT\$) GOSUB 860,960,10

40,1240 770 GOTO750 780 PRINT@107, "SELECTIONS: " 790 PRINT@162,"1) INPUT ACCOUNTS 800 PRINT@194,"2) VIEW ACCOUNTS" 810 PRINT@226, "3) ADD/CHANGE ACC **DUNTS"** 820 PRINT@258,"4) RETURN TO MAIN MENU" 830 PRINT@394,"(1, 2, 3 OR 4)" 840 AT\$=INKEY\$: IF AT\$="" THEN 84 850 RETURN 860 'INPUT ACCOUNTS 870 GOSUB 1760 880 CLS: X=0: OPEN"0",#1, "EXPENSE/ ACC" 890 CLS:PRINT" PRESS (ENTER) WH EN FINISHED": PRINT 900 X=X+1 910 INPUT"EXPENSE ACCOUNT: "; EX\$ (X) 920 IF LEN(EX\$(X))>10 THEN PRINT CATEGORY IS TOO LONG! -REDO!" :GOT0910 930 IF EX\$(X)=""THEN CLOSE#1:GOT 0730 940 WRITE #1, EX\$(X) 950 GOTO 900 960 'VIEW ACCOUNTS 970 X=0:CLS:PRINT" EXPENSE ACCOUNTS": PRINT 980 OPEN "I",#1,"EXPENSE/ACC" 990 IF EOF(1)=-1 THEN CLOSE#1:EX EC44539: GOTO730 1000 X=X+1 1010 INPUT #1,EX\$(X) 1020 PRINTX:" ":EX\$(X) 1030 GOTO 990 'CHANGE ACCOUNTS 1040 1050 CLS: X=0: OPEN" I", #1, "EXPENSE /ACC" 1060 OPEN"O", #2, "TEMP/ACC" 1070 IF EOF(1)=-1THEN 1160 1080 X=X+1 1090 INPUT #1,EX\$(X) 1100 CLS: PRINT@64, X; " ":EX\$(X) 1110 GOSUB1580 1120 ON VAL(Q2\$) GOSUB 1130,1070 1130 INPUT" NEW ACCOUNT: ":EX\$(X) 1140 WRITE#2, EX\$(X) 1150 GOTO1070 1160 PRINT: INPUT"DO YOU WISH TO (Y/N)";Q3\$ ADD AN ACCOUNT 1170 IF Q3\$="N" THEN1200 1180 X=X+1

1190 GOTO1130 1200 CLOSE#2,#1 1210 KILL"EXPENSE/ACC" 1220 RENAME"TEMP/ACC"TO"EXPENSE/ ACC" 1230 GOTO730 1240 'RETURN TO MAIN MENU 1250 CLS: GOTO110 1260 ' INCOME ACCOUNTS 1270 CLS: PRINT@10, "INCOME ACCOUN T5" 1280 GOSUB 780 1290 ON VAL (AT\$) GOSUB 1310,1410 ,1490,1790 1300 GOTO1280 1310 'INPUT ACCOUNTS 1320 GOSUB 1760 1330 CLS: X=0: OPEN"O", #1, "INCOME/ ACC" 1340 PRINT" PRESS (ENTER) WHEN FINISHED": PRINT 1350 X=X+1 1360 INPUT"INCOME ACCOUNT: ";IN\$ 1370 IF LEN(IN\$(X))>10 THEN PRIN CATEGORY IS TOO LONG! -REDO! ": GOTO1360 1380 IF IN\$(X)="" THEN CLOSE #1:

COCO DOS FLEX OS-9 DEUELOPMENT

C COMPILER generate.fast efficient code longs, FLOATS, most operators FLEX \$59.95 OS-9 \$59.95 COCO DOS \$49.95 RASMB Relocatable Macro Assembler assembler, LINKER, library builder link only needed modules FLEX \$59.95 OS-9 \$59.95 COCO DOS \$49.95 GTRM HI RES DS-9 WINDOWS 52x24 hi-res display multi-window displaying OS-9 only \$29.95 SOLUE SYMBOLIC DEBUGGER debug using symbols easy to use/understand-many features NEH PRICE \$75.00 (\$150 value) MATH PACK complete math package requires RASMB or INTROL C RASMB version \$49.95 INTR IBM PC ON THE SSSØ BUS INTROL C \$75.00 run PCDOS, MSDOS write for details Add \$3 for shipping Foriegn add 15% UISA and MC welcomed California orders add 6%

For more information write (or call:

Post Office Box 305

Solana Beach, Calif. 92075 (619) 755-4373

Technical information 6 am to 8 am PDT only Dealer inquiries welcome

*Flex—trademark of TSC, OS-9 trademark of Microware



WE GIVE A HOOT

LABEL III — Name and address file-print system. With LABEL III, you can develop and maintain a mailing list. Print lists or mailing labels in your choice of 1, 2, or 3 wide. Supports 3 or 4 line addresses with phone optional. FAST machine language sort by last name, first name, or zip code.

CASSETTE-16K EXT Postpaid

\$ 19.95

FILE III -- DATA MANAGEMENT SYSTEM.

With FILE III you can create and maintain records on anything you choose. Recipes, coupons, household records, financial records — you name it. You create records containing up to five fields you define. You can search, sort, modify, delete, save on tape and display on the screen or send it to a printer. The program is user friendly and user proof. Prompting is extensive. A comparable program could cost much more. This one is a bargain!

CASSETTE-16K EXT Postpaid

\$ 19.95

PROGRAM FILE (reviewed in October '83 Rainbow) Organize your cassette programs. With PROGRAM FILE you can create a file of your computer programs. You can search, sort, modify, add, delete, save on tape and display on screen or printer.

CASSETTE-16K EXT Postpaid

\$ 14.9

DATA MANAGEMENT PACKAGE Three cassettes above. Postpaid

\$ 40.00

ESPIONAGE ISLAND ADVENTURE (reviewed in June 1984 Rainbow) You have been dropped off on a deserted island by submarine. You must recover some top secret microfilm and signal the sub to pick you up. Problems abound in this 32K adventure.

32K EXT Postpaid

Disk - \$ 20.95

Cassette - \$ 17.95

FOUR MILE ISLAND — (reviewed May '84) You are trapped inside a disabled nuclear power plant. The reactor is running away! You must bring the reactor to a cold shutdown and prevent the "China Syndrome" Can you save the plant (and yourself)? It's not easy!

16K EXT Postpaid

Disk - \$20.95

Cassette -- \$ 17.95

KINGDOM OF BASHAN — (reviewed in Nov. '84 Rainbow) Our most involved adventure to date. Bashan has a large vocabulary and some unique problems to solve. You must enter BASHAN (not easy), gather the ten treasures of the kingdom while staying alive (even harder), and return to the starting point (harder yet). If you can get the maximum 200 points, you are an expert!

32K EXT Postpaid

Disk \$ 20.95 Cassette - \$ 17.95

ADVENTURE COMBO

Three adventures above. Disk or tape (Specify) Postpaid \$40.00

ATLANTIS ADVENTURE (reviewed in May '84)

This one is tough! We challenge you to complete this in 30 days! If you can, we will send you any program we sell—postpaid—at absolutely no charge. You start on a disabled sub near the lost city of Atlantis. You must get the sub (and yourself) safely to the surface.

Postpaid 32K EXT DISK \$24.95

16K EXT TAPE- \$ 21.95

ADVENTURE STARTER - (reviewed Feb. '84 Rainbow)

Learn to play those adventures the painless way. You start with a simple adventure and move into an intermediate. Two complete, separate adventures plus hints and tips on adventuring. Finish this and you are ready for ATLANTIS!

CASSETTE 16K EXT - Postpaid

\$ 21.9

NEW! CUBE ADVENTURE — Cube is a non-violent adventure for a 16K EXT tape or disk system. You must locate and enter the CUBE gathering treasures along the way. You will encounter some unique problems to solve.

16 EXT Postpaid

Disk - \$ 20.95

Tape- \$ 17.95

*C.O.D. orders please add \$1.50 *No delay for personal checks

IN A HURRY? CALL OUR HOOT LINE: (615) 238-9458

VISA*

OWLS NEST SOFTWARE
P.O. BOX 579, OOLTEWAH, TN 37363

MasterCard

GOT01260 1390 WRITE #1, IN\$(X) 1400 GOTO 1350 1410 ' VIEW ACCOUNTS 1420 CLS: X=0:PRINT" INCOM E ACCOUNTS": PRINT 1430 OPEN "I",#1,"INCOME/ACC" 1440 IF EDF(1) =- 1 THEN CLOSE#1:E XEC44539: GOTO1260 1450 X=X+1 146Ø INFUT#1, IN\$(X) 1470 PRINTX:" ": IN\$(X) 1480 GOTO 1440 1490 'CHANGE ACCOUNTS 1500 CLS: X=0:OPEN"I",#1,"INCOME/ ACC" 1510 OPEN"O",#2,"TEMP/ACC" 1520 IF EOF(1)=-1 THEN 1680 1530 X=X+1 1540 INPUT #1, IN\$(X) 1550 CLS:PRINT@64,X;" ":IN\$(X) 1560 GOSUB1580 1570 ON VAL(Q2\$) GOSUB 1650,1520 ,1660 1580 PRINT: PRINT" DO YOU WISH TO 1590 PRINT" 1) CHANGE THE ACCOU NT" 1600 PRINT" 2) DELETE THE ACCOU NT" 1610 PRINT" 3) SEE NEXT ACCOUNT 1620 PRINT 1630 INPUT Q2\$ 1640 RETURN 1650 INPUT" NEW ACCOUNT: ":IN\$(X) 1660 WRITE #2, IN\$(X) 1670 GOTO1520 1680 PRINT: INPUT"DO YOU WISH TO ADD AN ACCOUNT (Y/N)": Q3\$ 1690 IF Q3\$="N"THEN 1720 1700 X=X+1 1710 GOTO1650 1720 CLOSE#2,#1 1730 KILL"INCOME/ACC" 1740 RENAME"TEMP/ACC"TO"INCOME/A CC" 1750 GOTO1260 1760 CLS: PRINT"PREVIOUSLY ENTERE D ACCOUNTS WILL BE LOST !!" 1770 FRINT"DO YOU WANT TO CONTIN UE (Y/N)": INPUT AZ\$ 1780 IF AZ\$="N"THENGOTO110ELSE R ETURN 1790 'RETURN TO MAIN MENU 1800 CLS: GOTO110

1810 'END SUB-ROUTINE

0

1820 RUN"RENTMENU"

From Computer Plus to YOU...

PLUS after PLUS after PLUS

A SPECTACULAR OFFER!



SMITH-CORONA L-1000

\$259.00

The Smith-Corona L-1000 text printer delivers fully formed executive quality daisy wheel print at a speed of 12 characters per second. It features bi-directional printing, triple pitch — 10, 12, 15 cpi, logic seeking, underlining, 570 character buffer, and has both a serial and parallel interface for easy connection to any computer. It takes single sheets of paper up to 13 inches wide, and an optional continuous forms feed can be added at any time.

The Smith-Corona L-1000 is a simple, low cost and reliable text printer backed by the quality workmanship of Smith-Corona. The L-1000 is compatible with most word processors, and even if you own a dot matrix printer this is a great opportunity to obtain professional looking results at an affordable price.

Take advantage of this one time offer from Computer Plus while supplies last.

CALL TOLL FREE 1-800-343-8124

- LOWEST POSSIBLE PRICES
- BEST POSSIBLE WARRANTY
- KNOWLEDGEABLE SALES STAFF
- TIMELY DELIVERY
- SHOPPING CONVENIENCE







computer

P.O. Box 1094 480 King Street Littleton, MA 01460 PIUS SINCE 1973

IN MASSACHUSETTS CALL (617) 486-3193



THE "THIRD WAVE" has arrived with a new organization designed to support the growing number of people who work in their homes with personal computers. The newly formed Association of Electronic Cottagers will bring focus to this group. "We will provide actual business services to both computer entrepreneurs and telecommuters who work at home on a salary," the group's founders, husband-and-wife team Paul and Sarah Edwards, said in announcing the group's formation.

Members of AEC can obtain marketing assistance, business consultation and other services. They can also access up to the minute news about local, state, national and international developments affecting their interests through a monthly newsletter, an online hotline, bulletin boards, electronic conferences and private databases available to AEC members through CompuServe Information Service. Aspiring cottagers can get help finding work at home and assistance in setting up a computer-based business.

Electronic cottage members are already mobilizing to protect their rights to work at home with a computer by opposing AFL/CIO efforts to ban telecommuting and by setting forth the Electronic Cottage Bill of Rights.

Those interested in AEC can write the Association for free information at 677 Canyon Crest Drive, Sierra Madre, CA 91024.

PUT YOUR COMPUTER TO WORK.

Making Money with Your Home Computer, written by Dana K. Cassell, has been published by Dodd, Mead & Co. A paperback retailing for \$5.95, the book tells home computer owners what software to buy, how to get started, where to look for potential customers, what services to offer and how to build and maintain a profitable and satisfying computer service bureau business.

It can be ordered through Dodd, Mead & Co., Dept. CDH, 79 Madison Ave., New York, NY 10016, for \$5.95 plus \$1.50 postage; or order by phone using Visa or MasterCard: 1-800-251-4000.

'C' YOUR REFERENCE CARD. If you program in the C language, or are learning it, you can now get information you need from the first comprehensive C reference card. The card, entitled "C LANGUAGE," is a two-sided two-color 8½ by 11-inch plastic card filled with four point type. It covers the full implementation of the language and auxiliary utilities, too.

Covered are: statement summary; basic data types; conversion of data types; operator definitions with precedences and associativity; escape characters; preprocessor statements; typedef; constants; scope of variables; arrays; pointers; functions; structures; unions; enumerated data types; printf; scanf; the UNIX (tm) cc command; the lint command; a summary of over 100 commonly used library functions; command line arguments; tools under UNIX; ASCII; and more.

The summary was written by Stephen Kochan, author of *Programming in C* (Hayden Book Company) and consultant to Bell Labs. Micro Chart #11 and other summaries are available with a money-back guarantee for \$5.95 each (plus \$1 postage) from Micro Logic, POB 174, Dept. P, Hackensack, NJ 07602; phone (201) 342-6518.

THOSE SUMMER DAYS. "How I Spent My Summer Vacation" essays will never be the same for youngsters attending the 1985 National Computer Camps. Camp locations are in Simsbury (Hartford), Connecticut; Atlanta, Georgia; St. Louis, Missouri; Pepper Pike

(Cleveland), Ohio; and Garrison (Baltimore), Maryland. The camps are directed by Dr. Michael Zabinski, professor at Fairfield University. Dr. Zabinski serves as a consultant to school systems throughout the country.

Campers may sign up for one or more weeks during June, July and August. The coed campers, ages 9-18, will have small group instruction on TRS-80 and Apple computers. Dr. Zabinski will be assisted by experienced elementary and secondary school teachers.

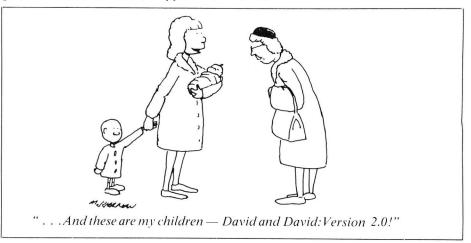
The camp is for youngsters of all levels of experience including no experience whatsoever. In addition to computers, the campers will have access to recreational facilities including swimming and tennis.

For further information and a brochure contact Michael Zabinski, Ph.D., at (203) 795-9667, or write to National Computer Camps, Box 585, Orange, CT 06477.

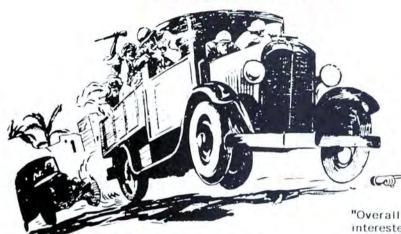
INTERNATIONAL ELECTRONIC

Technology has established the Center for Electronic Theft Prevention. This center will utilize a new advancement to the Kaish Circuit Lockout system, which will allow authorized service centers to re-program chips that are on Circuit Lockout via telephone links with the center without removal or replacement of the Lockout chip.

For details, contact Norman Kaish, president of International Electronic Technology Corporation, 1931 Mott Avenue, Far Rockaway, NY 11691; (718) 327-1119.



included SPECTRUM ADVENTURE GENERATOR



\$100 REWARD for all SAG winning entries in the Third Annual Rainbow Adventure Contest!

The Spectrum Adventure Generator (SAG) allows you to create silent and talking adventure games that are 100% machine language and very fast in execution. Up to 99 rooms, 255 objects, 70 command words and 255 conditional flags can be used. Get a head start in this month's Rainbow Adventure Contest NOW! 32K/64K DISK \$39.95

Note - Talking version requires Spectrum Projects' Voice Pak, a Disk "Y" Cable or Multipak and 64K.

Quotes from Jorge Mir (#1 CoCo Adventure Expert) from Dec'84 Rainbow Review -

"Overall, I think this is a great system for those interested in writing adventures. It sure eliminates a lot of time involved in developing them and allows the non-programmer to develop some very interesting Adventures since no programming knowledge is required. Try SAG, you'll like it!"

THE RAINBOW BOOKSHELF

The Complete Rainbow Guide To OS-9 by #1 CoCo OS-9 Expert - Dale Puckett

Order NOW, as we expect huge backorders to possibly develop !!!

The Rainbow Book of Simulations

Be an air traffic controller, Presidential candidate... 20 Super Simulations Book \$9.95 Tape \$9.95

Please NOTE - Book & Tape are sold separately. There is NO documentation with Tape.

ALL ORDERS PLUS \$3.00 S/H - NY RESIDENTS ADD SALES TAX

SPECTRUM PROJECTS

WEST DIVISION PO BOX 9866

EAST DIVISION PO BOX 21272 SAN JOSE, CA 95157-0866 WOODHAVEN, NY 11421

\Diamond

SPECTRUM PROJECTS COLORFUL COMP

SPREADSHEET

Competition DYNACALC 32X16 51X24 Screen Precision 9 digits 16 digits YES Hi-Res Graphics NO Visicalc cmd format NO YES DYNACALC now runs on CoCo DOS! New low price! 64K Disk \$79.95 (see Sept '84 Rainbow Review)

SAVE \$40!



DATA BASE MANAGER

PRO-COLOR FILE "Enhanced" - 60 Data Fields, 8 Report Formats, 1020 byte/record, Sort 3 Fields 4 Screen Formats, Duplicate Records and Fields, Global Search, Create Files Compatible w/DYNACALC! - Disk \$59.95 (see June '84 Rainbow Review)

DISK DRIVES



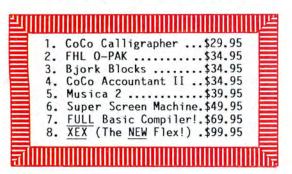


GAME CONTROLLERS

Graphicom Joystick - Has 2 Fire buttons (menu/pen), smooth and easy joystick control - \$24.95

Mach II Joystick - 360 Degree
control with center return or
analog positioning. "A firstclass performer... best feel of any CoCo joystick..." - \$39.95

UTILITIES (DISK)





Precision Time Module ...\$59.95 Master Key - "CRACKER" ..\$99.95 CoCo Video Digitizer ..\$199.95 GEMINI 15X w/PBH Int ..\$399.95

1 2 8 K CORNER 64K to 128K Upgrade - Specify Original or 26-3026/27 ..\$99.95 DRV3- Create 64K RAM Disk\$19.95

WEST PO BOX 9866 SAN JOSE, CA 95157-0866

SPECTRUM PROJECTS PO BOX 21272

EAST

WOODHAVEN, NY 11421

\Diamond

SPECTRUM PROJECTS SOFT AND HARD WARES FOR COLORFUL COMPUTING

 \Diamond

COMMUNICATION

COLORCOM/E - A complete smart terminal package! Upload, Download, Hi-Res (51X24) screen, 300/1200 Baud, Offline Printing, Rompak/Disk* - \$49.95 * - Now with CoCo Sig & TBBS XMODEM support! Download ML! (see Feb '84 Rainbow Review)



WORD PROCESSING

TELEWRITER-64 - Three Hi-Res screens, true lowercase char's right justify, full screen editor. Tape \$49.95 Disk \$59.95 (see June '83 Rainbow Review) WIZ - New char set & visible end of line marker/TW-64 \$19.95

MODEMS

MINI-MODEM - 300 Baud, Originate/Answer, Full Duplex, Direct Connect - \$79.95 J-CAT Modem - Lowest priced auto/answer modem - \$129.95 HAYES Auto Dial/Answer \$239.95 ANCHOR - 300/1200 Baud \$299.95 Prices include Modem cable.



PRINTERS

GEMINI 10X (SG-10)- 120 cps, 2K buffer tract/frict feed \$249.95 GEMINI Daisywheel - Ltr quality 18 cps, bi-dir, PS! - \$349.95 (Parallel interfaces required.) PBH Parallel Interface - Save \$40 if ordered with above printers! - \$49.95 (Reg.\$89.95)

KEYBOARDS

SUPER-PRO (Mark Data) \$59.95*
KEYTRONICS keyboard - \$69.95**
HJL57 PROFESSIONAL - \$79.95**
Specify Model/Revision Board.
* Add \$5 for "F" board adapter
** Free function key software
COCO II HJL version available!!
15 key Numeric Keypad - \$69.95



MONITORS

MONOCHROME Monitors - 80x24 screens plus Hi-Res w/AUDIO! Green - \$99.95 Amber - \$119.95 13" COLOR Monitor - \$249.95 VIDEO PLUS - Video Interface for above monitors - \$24.95 CoCo II (Monochrome) - \$29.95 CoCo II(Color) Version - \$39.95

SAVE \$10

OFF COLORCOM/E WITH ANY MODEM
OFF TELEWRITER-64 WITH ANY PRINTER,
KEYBOARD OR MONITOR

SAVE \$10

ORDER PHONE LINES: 718-441-2807 & 408-243-4558

Dodging the lane jumpers with

Hi-Res Racer

By James W. Wood

Racer is a high resolution game which involves dodging cars as you pass them. Your car runs faster than your computerized opponents. (Would you expect to be slower?)

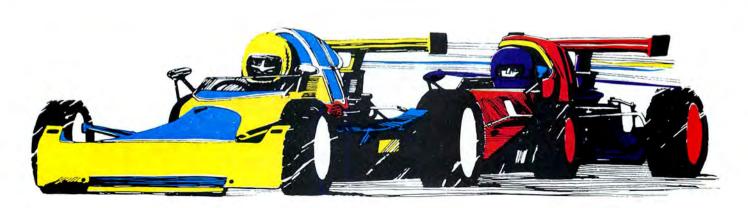
The road animation is accomplished by storing three different sets of center line stripes on different graphics pages. As the pages are flipped, the two-lane

(James Wood teaches high school math, science, computer programming and photography. He has master's degrees in both physical science education and instructional media.)

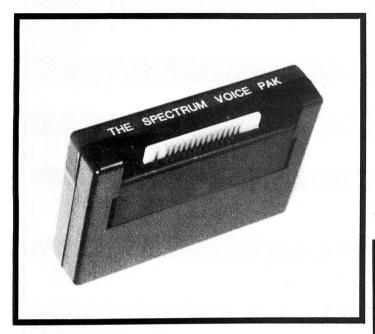
highway appears to move toward the bottom of the screen. The race cars are drawn and stored as arrays. They can be quickly PUT onto the screen. Your racer is at the bottom of the screen. Use the left- and right-arrow keys to dodge the other cars as you fly by them.

As the game proceeds, it becomes more difficult. After a short while, the cars that appear at the top of the screen will jump from their original lanes into the other lane. The cars only show in five positions as they move from the top to the bottom of the screen. If one lane jump doesn't cause you to rearend them, the game will later cause the cars to possibly jump lanes in the second and third positions as they come down the screen.

There is room for improvement in Racer. (Isn't that the best part?) One could add a better title page or add lines to allow more than one crash. The crash sequence could stand improvement; perhaps a high resolution crash could be stored on graphics Page six and shown at the moment of impact. Study the line description to decide which enhancement you will program, or enjoy the game "as is."



SPECTRUM VOICE PAK



CoCo I - \$69.95 CoCo II - \$79.95

All PAKs work with "Y" cable - \$29.95

Talking Software: Term Talk - TAPE \$39.95 Talking CoCo Bingo \$24.95 Educational Software \$24.95 Talking Final Countdown \$24.95

ANOTHER SPECTRUM SPECIAL! Buy any Voice Pak and get the SPECTRUM ADVENTURE GENERATOR at Half-Price! - \$19.95 (Reg. \$39.95)

FEATURE PACKED SYSTEM:

- Pull-Down Menus
- Icons & Font Styles
- Undo your mistakes
- Use w/video digitizer
- Full graphic editing
- Mouse, joystick or pad
- Hardware ROMPAK
- 256x192 joystick input

Requires Multi-Pak or Y-Cable

64K DISK \$69.95

Y-CABLE \$29.95



All orders plus \$3.00 S/H - NY Residents add sales tax

SPECTRUM PROJECTS

WEST DIVISION: PO BOX 9866

SAN JOSE, CA 95157-0866

EAST DIVISION: PO BOX 21272 WOODHAVEN, NY 11421

ORDER HOT LINES: 408-243-4558 & 718-441-2807

OUTILITIES OUTILITIES OUTILITIES OUT

FAST DUPE II

The fastest Disk copier ever! Will format and backup a diskette in only one pass and can make up to 4 Disk copies at once in 2 minutes! The must utility for every Disk owner, 32K/64K DISK \$19.95 (see May '84 Rainbow Review)



COCO VIDEO TITLER

Start your VCR tapes with dazzling title frames followed by professional countdown to black fadeouts! 16K TAPE \$19.95



AUT-O-START

Autostart your Basic/ML programs with impressive title screens using a mixture of text and graphics! 16K TAPE \$19.95

64K DISK UTILITY PACKAGE

Take advantage of an expanded 64K machine. Make an additional 8K of RAM available. Copy ROM cartridges to disk and create a 32K SPOOL buffer for printing. DISK \$21.95 (see July '83 Rainbow Review)

TAPE/DISK UTILITY

A powerful package that transfers tape to disk and disk to tape automatically. Does an automatic copy of an entire disk of programs to tape. Ideal for Rainbow On Tape to disk. TAPE/DISK \$24.95 (see Sept '83 Rainbow Review)

FAST TAPE

Save and load cassette files at twice the speed! Now you can run tape and printer I/O operations in the high speed mode without a locked up system or I/O ERRORS! "If you are tired of waiting for those long tapes to load, I strongly recommend that you buy this fine utility." TAPE \$21.95 July '83 Rainbow

GRAPHICOM

The ultimate CoCo graphics development tool with sophisticated editing, preview animation, telecommunications and printer support. Hi-Res graphics for only \$24.95. W/Spectrum's Menu Foot Switch \$34.95 or W/Spectrum's Graphicom Joystick \$49.95. 64K DISK (see April '84 Rainbow Review)

EZ BASE

A truly user friendly data base program at an affordable price. Maintain inventories, hobby collections, recipes, greeting card lists and much, much more! Hi-Res screen, up to 500 records with 15 fields, record or field search, and a Mailing Labels option. 32K DISK \$24.95 (see July '84 Rainbow

BLACKJACK ROYALE

A Hi-Res graphics casino blackjack simulation and card counting tutor. Fully realistic play includes: double down, splits, surrender, insurance bets, 1-8 decks, burnt cards, shuffle frequency and more! "This fine program is a must for the CoCo Blackjack player." (Aug '83 Rainbow Review) 32K TAPE/DISK \$24.95 (also see Dec '84 Rainbow Review)

SHIPPING \$3.00 - NY RESIDENTS ADD SALES TAX

SPECTRUM PROJECTS

WEST DIVISION PO BOX 9866 SAN JOSE, CA 95157-0866 WOODHAVEN, NY 11421 408-243-4558

EAST DIVISION PO BOX 21272 718-441-2807

DEALER/CLUB INQUIRIES INVITED SOFTWARE SUBMISSIONS WELCOMED

♦♦♦ COLORFUL UTILITIES ♦♦♦

COCO CHECKER

Something possibly <u>wrong</u> with your <u>CoCo??? CoCo CHECKER</u> is the <u>answer!!</u> Will <u>test</u> your ROMs, RAMs, Disk Drives & Controller, Printer, Keyboard, Cassette, Joysticks, Sound, PIAs, VDG, Internal Clock Speed, and more!! 16K TAPE/DISK \$19.95 (See Jan '85 Rainbow Review)

MULTI-PAK CRAK

Save ROMPAKs to your 64K Disk system using the RS Multi-Pak Interface. Eliminate constant plugging in of ROMPAKs now by keeping all your PAK software on disk. Includes POKEs for "PROBLEM" ROMPAKs. DISK \$24.95

TAPE 'N IMAGE

Easily handles programs with auto loaders, no headers, no EOF markers, unusual size blocks and more! Now is the time to get your tape software collection protected ... against loss!!! TAPE \$24.95

SPIT 'N IMAGE

A <u>super upgrade</u> from Disk Omni Clone! Back <u>everything up!</u> This <u>amazing</u> program handles "<u>non standard</u>" disks with ease. We haven't found any disk yet that it can't handle. Don't ever be <u>caught</u> without a backup again! Lowest price too! Beats most "copy protection" programs! 32K DISK \$29.95

COCO SCREEN DUMP

The <u>best</u> screen dump program for the <u>Epson</u> & <u>Gemini</u> printers ever! Have the option of <u>standard</u> or <u>reverse</u> images w/regular or <u>double sized</u> pictures. 600-9600 Baud too! A must for <u>Graphicom</u> and Bjork Block users. 16K TAPE/DISK \$19.95 (see Nov '84 Rainbow Review)

DISK UTILITY 2.1

A <u>multi-featured</u> tool for <u>USER FRIENDLY</u> disk handling. Utilize a <u>directory window</u> to <u>selectively</u> sort, move, rename and kill file entries. Lightning <u>fast</u> Disk I/O for <u>format</u>, copy and backup. <u>Examine</u> contents of files, the Granule Table, plus the size, load addresses and entry points of all programs. <u>Single</u> command execution of both <u>Basic</u> and <u>ML</u> programs. <u>32K/64K</u> Disk **\$24.95** (see Oct '84 Rainbow Review)

MASTER DESIGN

A text <u>designer/editor</u> to generate <u>graphics mode lettering</u> with multiple font sizes, textures, shadowing and thicknesses, plus <u>special patterns</u> for creative backgrounds. Comes with a screen print routine and <u>Letter Head Utility</u> that interfaces with <u>Telewriter-64</u> and <u>BASIC</u>. DISK **\$29.95** (see July '84 Rainbow Review)

BASIC COMPILER

Convert BASIC pgms into machine language. Produce faster and more compact code than BASIC. Integer compiler w/16K-64K versions included. TAPE \$39.95

SCHEMATIC DRAFTING PROCESSOR

Save time and design pro looking diagrams using a 480X540 pixel worksheet w/6 viewing windows. Over 30 electronic symbols w/10 definable symbols. Print hard copy and save to disk. 64K DISK \$49.95 (see Jan '84 Rainbow Review)

COLORAMA

A <u>first-class</u> Bulletin Board package... especially geared towards <u>CoCo users...</u> has an <u>ordering section</u> for those who want to run a <u>mail-order</u> business... supports <u>Color Graphics...</u> one nice piece of work. 64K DISK **\$99.95** July '84 Rainbow



COCO CHECKBOOK

Use your CoCo to keep track of your checking and savings accounts! Printout individual personal checks! 32K/64K TAPE \$29.95

SPECTRUM DISTRIBUTORS

MID-WEST



CANADA

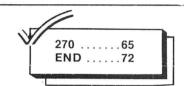
800-361-5155 312-736-4405

SOUTH

502-499-9393



Line	Description
20	Reserves memory for high resolution
	graphics
30	Title screen
40	Reserves memory for graphics arrays
50-130	Draws race cars for computer and player
	and stores them
140-240	Draws three views of the road on three
	different pages
250-280	Stores locations where race cars can be PUT
300-320	Deals with flipping pages
330	Sets computer's car at top of screen
340	Sets computer's car into second position
	after certain number of miles
350	Sets computer's car into third position after
	certain number of miles
360	Puts computer's car onto screen
370	Sets computer's car back to top of screen
380	Resets keyboard memory
390	Sets player's car's position according to
	arrow key pressed
400	Puts player's car onto screen
410	Shows Hi-Res screen which was just drawn
420	Keeps track of mileage
430	Determines if crash occurred
440	Variable to flip to correct road screen
450	Back to top of animation loop
460	Random color flash, crash sequence
470-490	Ending message



The listing:

- 60 CR\$="D10L2U4R2D16L2U4R2D6R6U6 R2D4L2U16R2D4L2U10L6BR2BD12U1R2D 1"
- 70 DRAW"BM2,054"+CR\$
- 80 GET(0,0)-(10,24),X,G
- 90 PCLS
- 100 DRAW"BM4,056"+CR\$
- 110 DRAW"BR2D2L6"
- 120 PAINT(6,30),1,1
- 130 GET(0,0)-(20,48),M,G
- 140 PMODEØ,1:PCLS
- 150 B=0:GOSUB210
- 160 PMODEØ,2:PCLS
- 170 B=14:GOSUB210
- 180 PMODEØ,3:PCLS
- 190 B=28:GOSUB210

320 PCOPY A TO E 330 IF G=0 THEN G=1: IF RND(2)=1 THEN H=1:GOTO360 ELSE H=6:GOTO36 340 IF J>50 AND G=1 THEN G=2: IF RND(2)=1 THEN H=2:GOTO360 ELSE H =7:GOTO360 350 IF J>100 AND G=2 THEN G=3:IF RND(2)=1 THEN H=3:GOTO360 ELSE H=8: GOTO360 360 PUT(R(H),S(H))-(R(H)+10,S(H) +24) X, PSET: H=H+1 370 IF H=6 OR H=11 THEN G=0 380 POKE343,255: POKE344,255 390 IF PEEK (343) = 247 THEN D=88EL SE IF PEEK (344) = 247 THEN D=144 400 FUT(D,140)-(D+20,188),M,PSET 410 SCREEN1.1 420 J=J+1 430 IF H=5 AND D=88 OR H=10 AND D=144 THEN 460 440 A=A+1: IFA=4THENA=1 450 GOTO300

460 SCREEN0.0:FOR AA=1TO20:CLSRN

D(9)-1:PLAY"L25501"+CHR\$(64+RND(

490 As=INKEYs: IFAs="Y"THENCLS0:R

UN ELSE IF A = "N"THENEND ELSE 49

470 CLS: PRINT@260, J/10; "MILES"

480 PRINT"PLAY AGAIN (Y/N)"

200 GOTO250

210 LINE(100,0)-(75,191),PSET 220 LINE(150,0)-(175,191),PSET

240 LINE(125, A+B) - (125, A+B+7), PS

250 FORA=1TO10:READ R(A):NEXTA 260 DATA 106,104,100,94,88,130,1

270 FORA=1TO10:READ S(A):NEXTA 280 DATA 10,40,70,100,140,10,40,

230 FORA=1TO190STEP42

300 IFE=4THENE=5ELSEE=4

ET: NEXTA: RETURN

35,138,140,144

70,100,140 290 A=1:D=88

310 PMODEQ.E

7)):NEXTAA

0

See You At RAINBOWfest CHICAGO May 17-19

SPECTRUM PROJECTS SHOPPING LIST

A CHIP OFF THE OLD ...

6821 Standard PIA\$9.95
6822 Industrial Grade PIA\$14.95
6847 Video Display Generator Chip. \$17.95
68764 (Fits Disk Basic Skt) Eprom. \$24.95
27128 16K DOS Eprom (Or 2 DOS's!).\$24.95
New SAM Chip w/heatsink (74LS785).\$29.95
6809E CPU Chip\$29.95
Ext Basic 1.1 ROM - NEW LOW PRICE.\$29.95
Basic ROM 1.2 Chip (30% FASTER)\$39.95
Disk ROM 1.1 (New DOS Command)\$39.95
Eprom Eraser - 3 min erasure time.\$49.95
CoCo First Aid Kit - includes 2 PIAs,
6809E & SAM (Be Prepared!!!)\$69.95
Lower Kit III - Specify CoCo I/II.\$69.95
Eprom Prgmr (2ms speed/2K - 16K).\$139.95
64K CoCo II - SALE!!!\$169.95

COCO LIBRARY...

CoCo I Technical Manual\$7.95
CoCo Memory Map\$12.00
Rainbow Book & Tape of Adventures. \$14.95
Basic Programming Tricks Revealed. \$14.95
The FACTS - Inside "guts" of CoCo.\$14.95
500 Pokes, Peeks 'N Execs\$16.95
Basic 09 Tour Guide\$18.95
Disk Basic (1.0/1.1) Unraveled\$19.95
Color Basic 1.2 Unraveled\$19.95
New! CoCo II Service Manual\$19.95

MORE GOOD STUFF...

27128/68764 Adapter - Allows you to plug-in 28pin EPROMs into 24pin sockets! Fits all controllers for 16K DOSs \$19.95 CoCo Freeze Frame - Stop your CoCo dead in its tracks! Put games on "HOLD"\$19.95 Mini-Mouth Add audio to a monitor.\$24.95 CoCo Light Pen with 6 programs ...\$24.95 PBH Parallel Interface - Beats Botek! 300-9600 baud w/ptr-modem switch .\$69.95 PBJ WORD-PAK II - Hi-Res 80x24 display with smooth scrolling!\$139.95 Microfazer SER/PAR print buffer .\$179.95

COCO CABLES AND...

Printer/Modem 15' Extender\$14.95

Tired of unplugging devices from your RS232 port? Try a RS232 "Y" Cable.\$19.95

Joystick/Touch Pad 10' Extender ...\$19.95

Disk Interface/Rom Pak Extender — Move your disks and ROM Paks where you want them. Gold connectors.* (3 feet) .\$29.95

Triple RS232 Switcher — Now select one of any three RS232 peripherals ...\$29.95

40 Pin Dual "Y" Cable — Hook up a Disk w/Voice or Word Pak, X-Pad, etc ..\$29.95

Triple "Joy" Switcher — Joystick, Mouse, Touch Pad or Light Pen!\$39.95

40 Pin Triple "Y" Cable — Hook up any 3—Voice/Word/RS232/Digitizer PAKs ..\$39.95

* N O T for use with a Multipak

OTHER GOOD STUFF...

C-10 tapes in any quantity49 cents 5 1/4" Diskettes in any quantity ..\$1.99 Joystick, Cassette or Serial plug .\$3.99 32K, 64K or 128K RAM Button\$4.99 GEMINI 10X/OKIDATA Ribbon\$4.99 Rompak w/Blank PC Brd 27xx series .\$9.95 The Disk Doubler - Doubleside your 5 1/4 diskettes for 160K more storage ..\$14.95 Video Clear - This cable will reduce TV interference created by CoCo!\$19.95 Video Reverser -Reduce eyestrain w/green letters on black background**\$24.95 The Magic Box - Load Mod I/III Basic program tapes into the CoCo\$24.95 DOS Switcher - Select from any two DOSs (Disk 1.0 1.1, JDOS) in J&M ctlr .\$24.95 CoCo Cooler- State D.E or CoCo II.\$49.95 Stereo Pak - Hardware synthesizer used w/Musica 2...superb stereo sound! \$39.95 ** N O T for 26-3134/36 CoCo II's

SPECTRUM PROJECTS

EAST DIVISION:

PO BOX 21272 WOODHAVEN, NY 11421

WEST DIVISION :

PO BOX 9866 SAN JOSE, CA 95157-0866



Compare it with the rest. Then, buy the best.

If you've been thinking about spending good money on a new keyboard for your Color Computer, why not get a good keyboard for your money?

Designed from scratch, the HJL-57 Professional Keyboard is built to unlock ALL the potential performance of your Color Computer. Now, you can do real word processing and sail through lengthy listings...with maximum speed; minimum errors.

At \$79.95, the HJL-57 is reasonably priced, but you can find other CoCo keyboards for a few dollars less. So, before you buy, we suggest that you compare.

Compare Design.

The ergonomically-superior HJL-57 has sculptured, low profile keycaps; and the three-color layout is identical to the original CoCo keyboard.

Compare Construction.

The HJL-57 has a rigidized aluminum baseplate for solid, no-flex mounting. Switch contacts are rated for 100 million cycles minimum, and covered by a spill-proof membrane.

Compare Performance.

Offering more than full-travel, bounce-proof keyswitches, the HJL-57 has RFI/EMI shielding that eliminates irritating noise on displays; and four user-definable function keys (one latchable), specially-positioned to avoid inadvertent actuation.

Free Function Key Program

Your HJL-57 kit includes usage instructions and decimal codes produced by the function keys, plus a free sample program that defines the function keys as follows: F1 = Screen dump to printer. F2 = Repeat key (latching). F3 = Lower case upper case flip (if you have lower case capability). F4 = Control key; subtracts 64 from the ASCII value of any key pressed. Runs on disc or tape; extended or standard Basic.

Compare Installation.

Carefully engineered for easy installation, the HJL-57 requires no soldering, drilling or gluing. Simply plug it in and drop it right on the original CoCo mounting posts. Kit includes a

new bezel for a totally finished conversion.

Compare Warranties.

The HJL-57 is built so well, it carries a full, one-year warranty. And, it is sold with an exclusive 15-day money-back guarantee.

Compare Value.

You know that a bargain is a bargain only so long as it lasts. If you shop carefully, we think you will agree...The HJL-57 is the last keyboard your CoCo will ever need. And that's real value.

Order Today.

Only \$79.95, the HJL-57 is available for immediate shipment for either the original Color Computer (sold prior to October, 1982) or the F-version and TDP-100 (introduced in October, 1982), and the new 64K CoCo. Now also available for CoCo 2.

Call Toll Free 1-800-828-6968

In New York 1-800-462-4891



Div. of Touchstone Technology Inc. 955 Buffalo Road • P.O. Box 24954 Rochester, New York 14624

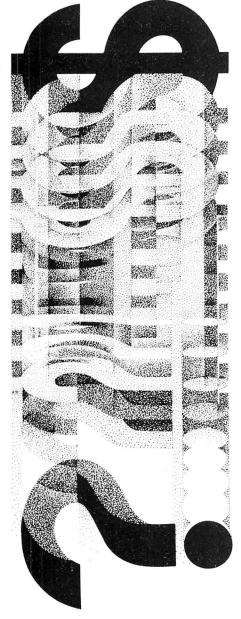
Telephone: (716) 235-8358

Ordering Information: Specify model (Original, F-version, or CoCo 2). Payment by C.O.D., check, MasterCard or Visa. Credit card customers include complete card number and expiration date. Add \$2.00 for shipping (\$3.50 for Canada). New York state residents add 7% sales tax. Dealer Inquiries invited.



Your CoCo can analyze the prospects and show which ones are 'go/no go' investments

Watching Your Cash Flow Rate of Return



By William S. Bonnell

n business, projects are attractive if they produce a rate of return on Linvestment greater than a company's cost of capital. This produces a net inflow of cash into the company. If a company has unlimited funds, it invests in all projects having a rate of return greater than the company cost of capital. In reality, projects are rejected even though they have a favorable rates of return because funds are limited.

Capital budgeting ranks projects according to their financial attractiveness and selects the set which maximizes the present worth (PW) of the firm. One method of capital budgeting compares projects on the basis of present worth, considering those for investment which have a cash flow rate of return (CFRR) greater than some minimum required rate of return, the cost of capital.

The program described in this article determines the CFRR and PW of a project and allows sensitivity testing of the assumptions made in the calculations.

The required parameters for calculation of CFRR and PW for a project are:

- 1) Expenses by year
- 2) Savings by year

(William Bonnell is an industrial engineer specializing in modeling of manufacturing and business computer systems. He has a master's degree in management science and 15 years experience with large organizations.)

- 3) Capital investment by year
- 4) Tax rate percent
- 5) Investment tax credit percent
- 6) Type of depreciation
- 7) Depreciation life of capital
- 8) The required rate of return percent

Expenses are defined as the annual cost of operations. They are not depreciated. They represent the outflow of cash resulting from the alternative being investigated. Savings are the opposite of expenses and represent the inflow of cash from the alternative in question. Expenses can be netted out of savings or both can be entered separately. Examples of expenses are labor, overhead and raw materials. Savings result from prevented expenditures or reductions in labor, overhead and raw materials.

Capital expenditures are investments in building and equipment which are allowed by law to be recovered over time through depreciation.

The tax rate is the percentage of profits which the organization must pay to the government. Investment tax credit is a means the government uses to stimulate business investment in capital equipment. Generally in the year following the capital expenditure, the organization is not taxed for a percentage of the expenditure.

The required rate of return depends on the nature of the company involved. If the company finances its operations by borrowing, the cost of capital is the borrowing rate. If projects have a rate of return greater than the borrowing rate, they will be profitable. Therefore, the required rate of return is the borrowing rate.

In companies financing their operations by common stock or a combination of stock and debt, the cost of capital is more difficult to determine. In these cases, the cost of capital may be a policy variable supplied by management as a benchmark for comparison of projects in general. It may be unrelated to the true cost of capital funds to the company.

The PW of a project is defined as the net cash flow (inflow-outflow) when all flows have been discounted to the present. The basis for this concept is a dollar invested for one year is worth more than a dollar at the end of the year. Similarly, a dollar received a year from now is not worth as much as a dollar now. The value now of a dollar received a year from now is:

$$1/(1+r)$$
.

where 'r' is the rate of return a dollar could earn if invested at the company's cost of capital. The value now of one dollar received two years from now is:

$$1/(1+r)**2.$$

(Note: ** is used as a symbol for exponentiation.)

And in general, the value of a dollar received N years from now is:

$$1/(1+r)**N$$

If a company spends \$1,000 on a piece of equipment which will save \$400 each year for 5 years, what is the PW of this project, ignoring taxes and depreciation, if the company can earn 10% from other investments?

$$-1000/(1+.1)**0 + 400/(1+.1)**1 + 400/(1+.1)**2 + 400/(1+.1)**3 + 400/(1+.1)**4 + 400/(1+.1)**5$$

The present worth (PW) is \$516.31. The straightforward answer might seem to be \$1,000 since \$1,000 went out and \$2,000 came in, but this ignores the alternative uses of these funds.

Cash flow rate of return (CFRR) is defined as the rate, 'r,' which makes PW equal to zero in the following equation:

$$PW = CF1 + CF2/(1+r)**1 + CF3/(1+r)**2 + ... + CFN/(1+r)**N-1$$

where "CFN" is the net cash flow (inout) at the beginning of year 'N' (or at the end of year N-1).

CFRR is analogous to lending a sum of money and receiving annual payments which eventually pay off the original deposit plus interest. The interest rate earned is like CFRR.

To be accurate and of use in business, tax and depreciation effects on taxes must be considered. Depreciation is a method for recovering the cost of capital assets over time. Government policy determines how quickly the investment can be recovered. Faster recovery is more beneficial to business because of the time-value of money.



Money recovered sooner is more valuable than money recovered later.

There are many methods of depreciation depending on the type and life of the asset. Using straight line depreciation, 20% of an asset's value can be recovered each year after the first, assuming a five-year tax life. It is recovered by subtracting depreciation from profits. This means a company can shield a portion of its profits from taxes by depreciating its assets. This is an incentive for investment in new assets.

An accelerated method of depreciation is Sum of the Year's Digits (SOYD). If an asset has a depreciation life of five years, the SOYD is 15 (1+2+3+4+5). In the first year after the capital expenditure, this method would allow $\frac{5}{15}$ or .3333 of the asset value to be deducted from profits before calculating taxes. In subsequent years $\frac{4}{15}$, $\frac{3}{15}$, $\frac{2}{15}$, $\frac{1}{15}$ of the asset value could shield profits from taxes. The sum of these depreciation factors is usually one.

Double-declining balance is another accelerated method of depreciation. In the first year after capital expenditure, the depreciation factor is two divided by the asset life. In subsequent years, the remaining fraction to be depreciated is multiplied by 2/(asset life). The remaining fraction is the previous remaining fraction less the current

depreciation factor. Refer to Listing 1, lines 670-1100 for calculation of depreciation factors.

Once the depreciation factors have been determined, the after-tax cash flow is calculated for each year.

Cash Flow = Savings - Tax Rate*(Tax Base) - (Expense+Capital) + Investment Tax Credit

Tax Base = Savings - (Expense + Depreciation)

Investment Tax Credit = Tax Credit %
* Capital Investment In The Previous
Year

Refer to Listing 1, lines 1110 - 1250 for this calculation.

This annual net cash flow is then adjusted for the time-value of money at the company cost of capital. It is summed to get the net present worth of the project. The CFRR is calculated by finding rate of return, 'r,' which just makes cash inflows equal to cash outflows, causing PW to equal zero.

The Program

The program was written for the 16K Color Computer using disk or cassette. It should run on any computer using standard BASIC with very few modifications.

Data entry is prompted or menu driven. If flows become constant, the program allows one value to be entered for several years. There are four standard types of depreciation to choose from or factors may be entered manually.

After the data has been entered, the program calculates and displays the depreciation flows, the after-tax cash flow and the discounted after-tax cash flow using 15% as the discount rate. Present worth is calculated for various required rates of return. When PW changes sign from a positive to negative (passes through zero), that is the CFRR.

After the display of output is complete, data values can be changed and the problem rerun. This is a powerful tool for sensitivity analysis. Finally, data may be saved or read from disk or cassette. A report can be generated on a printer.

The algorithm to calculate CFRR is shown in Listing 1, lines 1510 to 1790. It is a binary search algorithm. If CFRR is in the range zero to 100 percent, the interval containing the CFRR is halved

each iteration until one endpoint is within three percent of the other.

At that point, the program interpolates for a final value of CFRR. For example, if the PW at R=100% is less than zero and PW at R=0 is greater than zero, PW is calculated at R=50%. If PW at 50 percent is less than zero, PW is found at R=75%. If PW at R=75% is greater than zero then PW is found at R=62.5%, and so on until the difference between successive R's is less than three percent. The program then interpolates the final CFRR.

To illustrate its use and verify your entry of the program, try the following example problem:

A company spends \$10,000 on a new computer system. By spending this amount, labor savings of \$4,000 are expected each subsequent year for 10 years. The company tax rate is 48% and an investment tax credit of 10% is available. It will cost \$500 per year for supplies for the new computer and \$400 per year for maintenance.

Computers can be depreciated with a five year life using double-declining balance switching to SOYD. What is the present worth of this investment if the company can earn 15% on alternative investments? What is the CFRR for this project?

INPUT DATA

Start	Year	Expense	Savings	Capital
1		0	0	10000
2 - 11		900	4000	0

Required Rate Of Return = 15% Tax Rate = 48% Investment Tax Credit = 10%

Listing 2 shows my inputs and the computer responses to solve this problem. It was produced by echoing the screen output to the printer. A printer report is also generated.

At 15 percent, this project has a positive net present worth indicating a worthwhile investment. The CFRR of 22 percent is greater than can be earned on the average investment available to the company (15 percent).

If other investments are available, they should be compared on the basis of present worth. Comparing on the basis of CFRR can, in some cases, lead to the wrong conclusion. The CFRR should be a "go/no go" comparison with the required rate of return for the company.

Project life=11 years Depreciation life=5 years Tax rate=48 percent Investment tax credit=10 percent

Year	Expense	Sayings	Capital	Dpr. Flow	Cash Flow
1	\$ 0.00	\$ 0.00	\$10,000.00	\$ 0.00	-\$10,000.00
2	900.00	4,000.00	0.00	2,000.00	3,572.00
3	900.00	4,000.00	0.00	3,200.00	3,148.00
4	900.00	4,000.00	0.00	2,100.00	2,620.00
5	900.00	4,000.00	0.00	1,500.00	2,332.00
6	900.00	4,000.00	0.00	900.00	2,044.00
7	900.00	4,000.00	0.00	300.00	1,756.00
8	900.00	4,000.00	0.00	0.00	1,612.00
9	900.00	4,000.00	0.00	0.00	1,612.00
10	900.00	4,000.00	0.00	0.00	1,612.00
11	900.00	4,000.00	0.00	0.00	1,612.00

Required	Present Worth
15%	-\$2307.51
30%	- 1742.79
45%	- 3846.28
60%	- 5107.03
75%	- 5940.91
90%	- 6532.03

CFRR = 22.18%

Hopefully, the value of this program has been demonstrated for analyzing alternative business investments. The concept is more fully explained in any good financial textbook.

_						

		. , ,	resent worth (r w)
		PW()	PW array for various rates
	List of Variables		of return
		R	Calculated CFRR
Variable	Function	R3,R4,	
A	Choice of option	R5,R6	Used in binary search CFRR
A\$	Answer to prompts		calculation
CA()	Capital expenditure array	RL	Remaining life in
CC	Capital input value		depreciation
CF()	Net cash flow array	RR	Required rate of return
D	Device for I/O		(ROR)
DC	Discounted cash flow	RR()	RORs used to calculate
DF()	Depreciation factors		PW()
DL	Depreciation life	RV	Remaining value in
DP()	Depreciation component of		depreciation
	cash flow	S1	Start year for editing data
DT	Depreciation type	SA()	Savings array by year
El	End year for editing changes	SF	Sum of cash flows in finding
EE	Expense input		payback
EX()	Expense array	SS	Savings input value
F\$	Filename	SY	Sum of years digits
FR	Double-declining balance	TC	Investment tax credit value
	fraction	TX	Tax rate
I,I1,		V1	Value to change in editing
J,K	Various year counters		data
N	Net present value (NPV)	YY	Year when input flows be-
N6	NPV in CFRR interpolation		come constant

OD

OP

P9

PB

PI.

PW

Old depreciation life

Present worth (PW)

Discounted payback time

Old project life

Payback time

Project life



10 CLS 20 PRINT" ****** ****** 30 PRINT" * CFRR PROGRAM, W. BO NNELL *" 40 PRINT" 3/24/1983 COPYRI GHT 50 PRINT" ******* ****** 70 PRINT: PRINT 80 DIM EX(20), SA(20), CA(20), DF(2 0), DF(20), CF(20), RR(6), PW(6) 90 INPUT "MENU ENTRY OR REGULAR ENTRY M/R": A\$

120 ' 130 IF PL>0 THEN CLS:PRINT"OLD P ROJECT LIFE="OP"YEARS"

100 IF LEFT\$(A\$,1)="M" THEN 1810

110 GOSUB 130:GOSUB 190:GOSUB 36

0:60SUB430:GOSUB500:GOTO 1110

140 INPUT "PROJECT LIFE"; PL: OP=P

150 IF PL>20 THEN 130

160 IF PL<1 THEN 130

170 RETURN

180 '

190 IF OD>0 THEN CLS: PRINT"OLD DEPRECIATION LIFE="OD

200 INPUT "DEPRECIATION LIFE";DL:OD=DL

210 CLS

220 IF DL>20 THEN 190

230 IF DL<1 THEN 190

240 PRINT

250 PRINT "DEPRECIATION TYPES:"

260 PRINT "1. SUM OF YEARS DIGIT

270 PRINT "2. DOUBLE DECLINING B

ALANCE"

280 PRINT "3. STRAIGHT LINE"

290 PRINT "4. DDB->SOYD 1/2YR.AV ERAGING"

300 PRINT "5. ENTER OWN FACTORS"

310 INPUT"CHOOSE": DT

320 ON DT GOSUB 690,740,820,900,

330 PRINT

340 RETURN

350 '

360 IF TX>0 THEN CLS:PRINT"OLD T

AX RATE=":TX*100

370 INPUT "TAX RATE IN %":TX

380 IF TX>99 THEN 360

390 IF TX<0 THEN 360

400 TX=TX/100

410 RETURN

420 '

430 IF TC>0 THEN CLS: PRINT "OLD

440 INPUT "INV. TAX CREDIT IN %"

INV. TAX CREDIT=";TC*100

; TC

450 IF TC<0 THEN 430

460 IF TC>99 THEN 430

470 TC=TC/100

48Ø RETURN

490 '

500 INPUT"DO ANNUAL FLOWS BECOME

CONSTANT Y/N ";A\$

510 IF LEFT\$ (A\$,1)<>"Y" THEN 590

520 CLS

530 INPUT "YEAR WHEN FLOWS BECOM

E CONSTANT"; YY: IF YY>PL THEN 530 540 PRINT "FOR YEAR WHEN FLOWS A

RE CONSTANT ENTER: "

550 PRINT

560 FRINT "EXPENSE, SAVINGS, CAPIT

AL FLOWS": INPUT EE,SS,CC

570 FOR I=YY TO PL:EX(I)=EE:SA(I

)=SS:CA(I)=CC:NEXT I

580 PRINT

590 PRINT"YEAR EXPENSE, SAVING,

CAPITAL"

600 IF YY=0 THEN YY=PL

610 FOR J=1 TO YY-1

620 PRINT USING "## "; J;

630 INPUT EX(J), SA(J), CA(J)

640 NEXTJ

650 RETURN

660

670 'GET DEPRECIATION FACTORS

680 'SUM OF YEARS DIGITS TYPE

690 IF INT(DL)=DL THEN SF=DL*(DL

+1)/2 ELSE SF=(DL+.5)*(DL+.5)/2

700 FOR J=DL TO 0 STEP -1

710 DF(DL-J+1)=J/SF

720 NEXT J

730 RETURN

```
740 'DOUBLE DELCINING BALANCE 1220 PRINT USING "#########"; DP( 1); CF(I); CF(I); CF(I) / (1.15)^(I-1)
760 FOR I=1 TO DL+.5
                                     1230 NEXT I
770 FR=2/DL
                                     1240 INPUT "HIT ENTER TO CONTINU
780 DF(I)=RV*FR
                                    E": A$
790 RV=RV-DF(I)
                                     1250 CLS
800 NEXT I
                                     1260
810 RETURN
                                     1270 'PRESENT WORTH
820 'STRAIGHT LINE
                                     1280 PRINT
830 RV=1
                                    1290 PRINT "REQUIRED AFTER TAX
840 FOR I=1 TO DL
850 \text{ DF}(I) = 1/DL
                                     1300 PRINT " RATE % PRESENT WOR
860 RV=RV-DF(I)
                                     THI
870 NEXT I
                                     1310 J=0
                                   1320 FOR R=.15 TO .91 STEP .15
880 DF(I)=RV
890 RETURN
                                     1330 J=J+1:RR(J)=R*100
900 'DDB TO SOYD 1/2 YR AVG CONV
                                    1340 PW=0:SM=0
NTN SWITCH IN 2ND YEAR
                                     1350 FOR I=1 TO PL
910 DF(1)=1/DL
                                     1360 DC=CF(I)/(1+R)^(I-1)
920 RV=1-DF(1)
                                     1370 SM=SM+CF(I)
930 DF(2)=2/DL*RV
                                     1380 FW=PW+DC
940 RV=RV-DF(2)
                                     1390 IF PB=0 THEN IF PW>0 THEN P
950 RL=DL-1.5
                                     B=I:RR=R
960 IF INT(RL)=RL THEN SY=RL*(RL
                                     1400 IF P9=0 THEN IF SM>0 THEN P
+1)/2:EN=1 ELSE SY=(RL+.5)*(RL+.
                                     9=T
5)/2
                                     1410 NEXT I
                                     1420 PRINT USING " ## % ":100*
97Ø K=2
980 FOR I=RL TO 0 STEP -1
                                    R:
                                    1430 FRINT USING "#########";PW
990 K=K+1
1000 DF(K)=I/SY*RV
                                     1440 FW(J)=FW
1010 NEXT
                                     1450 NEXT R
                                     1460 IF P9-1>0 THENPRINT "STRAIG
1020 RETURN
1030 'OWN FACTORS
                                     HT PAYBACK"P9-1"YEARS"
1040 CLS:PRINT "ENTER"DL"FACTORS
                                    1470 IF PB-1>0 THENPRINT "DISCOU
                                     NTED PAYBACK"PB-1"YEARS" ELSE PR
1050 FOR I=1 TO DL
                                    INT "NO DISCOUNTED PAYBACK"
1040 PRINT USING "## "; I;
                                     1480 IF RR=0 THEN RR=.15
1070 INPUT DF(I)
                                     1490 PRINT" AT "RR*100"%"
1080 NEXT
                                     1500
1090 RETURN
                                     1510 'GET CFRR
                                     1520 R=0:R3=0:R5=0:R6=0:N6=0
1110 'GET DEPR. AND AFTER TAX FL
                                     1530 R4=1
OWS
                                     1540 GOSUB 1690
1120 CLS
                                     1550 IF NK=0 THEN GOTO 1760
1130 PRINT: PRINT "START DEPREC A
                                     1560 R=R4
FTER TAX DISCOUNT"
                                     1570 GOSUB 1690
1140 PRINT"OF YR. FLOW CASH FLO
                                     1580 IF N>=0 THEN R=100:GOTO 176
W @ 15%"
1150 FOR I=1 TO PL
                                     1590 R=(R3+R4)/2
1160 IF I>DL THEN I1=I-INT(DL) E
                                     1600 IF ABS(R6-R)<=.03 THEN 1730
LSE I1=1
                                     1610 R6=R:N6=N
1170 FOR K=I1 TO I
                                     1620 GOSUB 1690
1180 DP(I)=DP(I)+CA(K-1)*DF(I-K+
                                     1630 IF NK0 THEN GOTO 1660
1)
                                     1640 IF N>0 THEN 1670
                                     1650 IF N=0 THEN 1760
1190 NEXT K
1200 CF(I)=SA(I)-TX*(SA(I)-(EX(I 1660 R4=R:GOTO 1590 )+DP(I)))-(EX(I)+CA(I))+TC*CA(I- 1670 R3=R:GOTO 1590
1)
                                     1690 PRINT@416, "wait ";:N=0:FOR
1210 PRINT USING "## "; I;
                                    I=1 TO PL:N=N+CF(I)/(1+R)^(I-1):
```

NEXT I 1700 PRINT @420,STRING\$(4.8); 1710 RETURN 1720 GOTO 1780 1730 N6=N 1740 GOSUB 1690 1750 R = (R-N*(R-R6)/(N-N6))*1001760 R=INT(100*R+.5)/100 1770 FRINT 1780 PRINT@416, "CFRR="R"%" 1790 INPUT "HIT ENTER TO CONTINU E"; A\$: PRINT 1800 1810 'CHANGE DATA ROUTINE 1820 CLS 1830 PRINT " entry/change menu 1840 PRINT "1. PROJECT LIFE" 1850 PRINT "2. DEPRECIATION LIFE 1855 PRINT "3. EXPENSES" 1860 FRINT "4. SAVINGS" 1870 PRINT "5. CAPITAL" 1890 PRINT "6. TAX RATE" 1900 PRINT "7. INV. TAX CREDIT" 1910 PRINT "8. SAVE DATA IN FILE 1920 PRINT "9. READ DATA IN FILE 1930 PRINT "10.RUN" 1940 PRINT "11. PRINT REPORT-(AFT ER OPT. 10)" 1950 PRINT "12.STOP" 1960 INPUT "CHOOSE"; A 1970 ON A GOSUB 130,190,2020,212 0,2220,360,430,2320,2420,2540,26 20 1980 IF A=10THEN GOSUB 320:GOTO 1990 IF A=12THEN STOP 2000 GOTO 1810 2010 2020 CLS:PRINT"YR EXPENSE

One-Liner Contest Winner . . .

This program, adapted from an algorithm used on a Texas Instruments 57 programmable calculator, computes the interest per period for normal annuities.

The listing:

1 PRINT:INPUT"PRESENT VALUE"; PV:
INPUT"PAYMENT "; PMT:INPUT"#
PERIODS "; N:F=PMT/PV:I=1.05:
FORT=1T030:I=(1-I^-N)*F+1:NEXT:P
RINT USING "INTEREST IS ###.##
PERCENT"; (I-1)*100:RUN

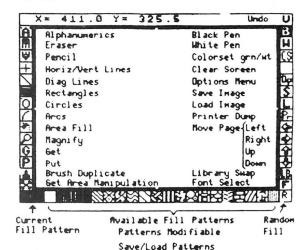
Bob vander Mark Groningen, The Netherlands

(For this winning one-liner contest entry, the author has been sent copies of both *The Rainbow Book Of Simulations* and its companion *Rainbow Simulations Tape*.)

```
YR
       EXPENSE"
2030 FOR I=1 TO PL
2040 PRINT USING "## "; I; : PRINT
USING "事事######## " EX(I) :
2050 NEXT
2060 PRINT: PRINT"ENTER START, END
 YR, EXPENSE": INPUT S1, E1, V1
2070 FOR I=S1 TO E1
2080 EX(I)=V1
2090 NEXT
2100 RETURN
2110
2120 CLS:PRINT"YR
                        SAVINGS
YR
       SAVINGS"
2130 FOR I=1 TO PL
2140 PRINT USING "## ":I::PRINT
USING "$$####### "; SA(I);
2150 NEXT
2160 PRINT: PRINT"ENTER START, END
 YR, SAVINGS": INPUT 51, E1, V1
2170 FOR I=S1 TO E1
2180 SA(I)=V1
2190 NEXT
2200 RETURN
2210
2220 CLS:PRINT"YR
                        CAPITAL
       CAPITAL"
2230 FOR I=1 TO PL
2240 PRINT USING "## ":I::PRINT
USING "$$####### "; CA(I);
2250 NEXT
2260 PRINT: PRINT"ENTER START, END
 YR, CAPITAL": INPUT S1, E1, V1
2270 FOR I=S1 TO E1
2280 CA(I)=V1
2290 NEXT
2300 RETURN
2310
2320 INPUT"ENTER DUTPUT FILE NAM
E":F$
2330 INPUT"TO DISK OR TAPE D/T":
A$: IF LEFT$ (A$,1)="D" THEN D=1 E
LSE D=-1:AUDIOON
2340 OPEN "O",#D,F$
2350 PRINT #D,PL;DL;TX;TC;DT;OD;
OP;
2360 FOR I=1 TO PL
2370 PRINT #D, EX(I); SA(I); CA(I);
2380 NEXT I
2390 CLOSE D
2400 RETURN
2410
2420 INPUT"ENTER INPUT FILE NAME
":F*
2430 INPUT"FROM DISK OR TAPE D/T
"; A$: IF LEFT$ (A$,1)="D" THEN D=1
ELSE D=-1: AUDIOON
2440 OPEN "I",#D,F$
2450 IF EOF(D)=-1THEN GOTO2500
```

2460 INPUT #D,PL,DL,TX,TC,DT,OD, OF 2470 FOR I=1 TO 20 2480 IF EOF(D)=-1THEN I=20:GOTO2 2490 INPUT #D,EX(I),SA(I),CA(I) 2500 NEXT I 2510 CLOSE D 2520 RETURN 2530 2540 'INITIALIZE THEN RERUN 2550 FOR I=0 TO 20 254Ø DF(I)=Ø:CF(I)=Ø:DP(I)=Ø 2570 NEXT 2580 PB=0:P9=0:RR=0 2590 GOSUB 320 'DEPREC 2600 GOTO 1120 2610 ' 2620 'PRINTER REPORT 263Ø PRINT#-2,"************ ********* 2640 PRINT#-2,"* CFRR PROGRAM, W . BONNELL *" 2650 PRINT#-2,"* 3/24/1983 CO FYRIGHT 2660 PRINT#-2,"************ ***** 2670 PRINT#-2:PRINT#-2 2680 FRINT#-2, "PROJECT LIFE=" OP"YEARS" 2690 PRINT#-2,"DEPRECIATION LIFE ="OD"YEARS" 2700 PRINT#-2,"TAX RATE="TX*100" 2710 PRINT#-2,"INVESTMENT TAX CR EDIT="TC*100"%" 2720 PRINT#-2 2730 PRINT #-2,"YEAR 2740 PRINT#-2,USING "% EXPENSE":" SAVINGS":" CAP ITAL": "DPR. FLOW": "CASH FLOW" 2750 FOR I=1 TO PL 2760 PRINT#-2,USING "## 2770 FRINT#-2, USING "\$\$########### ";EX(I);SA(I);CA(I);DP(I);CF(I) 278Ø NEXT I 2790 PRINT#-2 2800 PRINT#-2, "REQUIRED PRESEN T WORTH" 2810 FOR I=1 TO 6 2820 PRINT #-2,USING" ";RR(I); # ":PW(I) 2840 NEXT I 2850 PRINT #-2 2860 PRINT #-2,"CFRR="R"%" 2870 RETURN

VIZIDRAW 1.0



The INTERACTIVE DRAWING BOARD and GRAPHIC DISPLAY PROCESSOR will produce amazing presentation-quality graphics. To build a picture use the "ACTION ICONS" with your mouse or joysticks. ACTION ICONS include lines, circles, rectangles, circles, arcs and fills. Once an object is created it can be copied and moved or undone. Magnify mode lets you 'zoom' in to do fine touch-up work. Brush Duplicate lets you 'airbrush' any pattern. Comes with 14 FONT SETS which can be enlarged or italicised or bold font. Large worksheet (448 x 480 pixel)!

REQUIRES 64K DISK OR TAPE* 2 JOYSTICKS or MOUSE PRINTER OPTIONS: RS LINE PRINTER VIII FORMAT C-ITOH(NEC), EPSON, GEMINI 10 - 10X

PLEASE SPECIFY DISK or TAPE

\$49.95

VIDX - VIDEO DIGITIZER

Vidx connects between the video source and the RS-232 port of the color computer. No need for Y-cables or Multipacks! When VIDX is connected to your computer, you can digitize any source of video such as off air TV, video tape recorder, or live TV camera simply by issuing the proper command from the keyboard. The software used with VIDX is supplied on a non-protected RS format disk. The software has the following functions:

SINGLE OR MULTIPLE EXPOSURE ABORT or RESUME SCAN FRAME PICTURE LOGICAL 'AND' SCREEN 2 & 1 READ/WRITE GRAPHICOM DISK READ/WRITE RS-DOS DISK READ/WRITE TO CASSETTE

VIDX-1-\$99.95DIGITIZER & SOFTWARE VIDX-2-\$124.95 DIGITIZER & SOFTWARE

with two port RS-232 switcher, allows You to switch between VIDX and two other devices such as printer & modem PLUS \$3.00 POSTAGE



To Place Your Order Send Check or Money Order To:



West Mifflin, Pa. 15122 Voice (412)466-6974 (6-9 PM) 24 Hour BBS-COCONET (412) 744-2335 300 - 1200 Baud Modem Online

FREE DIGITIZED PICTURES!

GREAT COCO PRODUCTS



SUPER SCREEN

The Color Computer Supercharger

- A big 52 character by 24 line screen
- PRINT @' is fully implemented on the big screen
- Easily combine text with hi-res graphics
- Auto-key repeat for greater keyboard convenience
 The 'ON ERROR GOTO' statement is fully implemented
- Control codes for additional function

Super Screen comes with complete, well detailed instructions and is available on cassette or disc. It adjusts automatically to any 16K or greater, Extended or Disc basic Color Computer or TDP-100 and uses only 2K of memory in addition to the screen memory reserved during power up. Guaranteed to be the most frequently used program in your software library...once you use it, you won't be without it!

Hot CoCo, Jan. '84 "Super Screen represents a quality utility program that fills a definite need for the serious CoCo user. No other programs on the market so far have offered the

error-trapping utility of Super Screen."

Color Computer Magazine, May '84 "Super Screen is a worthy addition to anyone's software library. It has become my most used utility and has made programming in BASIC

Cassette \$29.95

NEW!

FASY-FILE

Data Management System

- Need a good mailing list or customer list program? How about a program to keep track of your investments, your computer magazines, or record collection? Do you have an inventory of all household items for insurance purposes? **EASY-FILE** will do all of these things and many more
- **EASY-FILE** makes data managing a breeze with single key menu selections, extensive error handling procedures, a demonstration data file and a detailed, easy
- FASY-FILE is powerful, too. It automatically enhances your monitor screen to a full upper and lower case, 51 character by 24 line display. EASY-FILE allows up to 30 data fields and provides password file protection, selectable numeric totalling and complete data searching and editing capabilities. You can quickly enter, locate, review and modify data records, and even transfer records from one file to another.
- Sorting? You bet! EASY-FILE allows you to sort up to 5 levels of data and allows you to define upper and lower limits as well. You can sort in many different ways and save the results in individual index files. These index files may be used later to determine what will appear on your printed reports.
- Reports are easily prepared with EASY-FILE because it offers so many automatic features. There is no need to generate complex report forms. With EASY-FILE you simply select from a list of options to determine what your report and header will look like. There are countless variations. EASY-FILE takes care of tab stops and field spacing automatically. Prepare horizontal reports (80 or 132 columns), vertical reports or labels! Save your favorite report formats right in a data file so they may be
- The EASY-FILE master disc and instructions are packaged in an attractive 3-ring binder. Requires 32K and at least one disc drive

Order yours now! Get organized for only \$59.95!

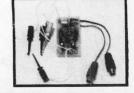
UNIVERSAL VIDEO DRIVER

Carefully engineered to work with ALL Color Computer models, including the new

COCO II ENABLES YOUR COCO TO OPERATE WITH A

VIDEO MONITOR INSTEAD OF A TELEVISION

- Works with Monochrome Monitors
- Works with Color Monitors!
- Audio Connection Included
- Easy Installation—No Soldering!
- Great Price! ONLY \$29.95



ORDER ENTRY SYSTEM

invoices, then this one will take care of those needs quite well... A good program that would serve the invoicing needs of a small company quite nicely.

The Mark Data Product sales order processing system provides a fast, efficient means to enter orders, print shipping papers and invoices, prepare sales reports, and monitor receivables. The system automatically enhances the monitor screen to a 51 character by 24 line display. 32K of memory is required along with an 80-column printer and one or more

The MDP Order Entry System is a family of programs which operate interactively by means of a "menu" selection scheme. Up to 900 products may be defined and a single disc system can hold over 600 transactions. When the operator selects a task to be performed, the computer loads a program designed to handle that task from the system disc. The system disc contains all of the programs required to create, update and maintain data files and prepare the necessary paperwork including shipping and invoice forms, daily sales reports, a monthly (or other period) sales report and a receivables report.

This order entry software equals or exceeds higher priced packages for other computers and includes a detailed operating manual. ONLY \$99.95



Computers produced after approximately October 1982 require an

ACCOUNTING SYSTEM

Rainbow, May '84 "Considering what it can do to organize a small business, it is quite a

Hot CoCo, June '84 "...a serious, professional accounting program and well worth its price. The programs are complete and simple to use.

The Mark Data Products Accounting System is ideal for the small businessman needing a fast, efficient means to process income and expenses, prepare detailed reports and maintain most of the information required at tax time. The system is a family of programs which operate by means of a "menu" selection scheme. When the operator selects a task to perform, the computer loads a program designed to handle that task from the system disc. The system disc contains all of the programs required to create, update and maintain data files and prepare the necessary accounting reports including a transaction journal, a P & L or income report, an interim or trial balance and a balance sheet.

Up to 255 separate accounts may be defined and a single disc system can hold over 1,400 transactions. This system automatically enhances the monitor screen to a 51 character by 24 line display. 32K of memory is required along with an 80-column printer and one or more disc drives

This accounting software equals or exceeds higher priced packages for other computers and includes a detailed operating manual.

SHIPPING: All orders under \$100 please add \$2 regular, \$5 air. All orders over \$100 please add 2% regular, 5% air. California residents please add 6% sales tax. Orders over \$100 please add 2% regular, 5% air. California residents please add 6% sales tax. Orders over \$100 please add 2% regular, 5% air. California residents please add 6% sales tax. the continental U.S., check with us for shipping amount; please remit U.S. funds. Software authors—contact us for exciting program marketing details. We accept MasterCard

FREE - Send for our NEW 24 page catalog!

Mark Data Products

24001 ALICIA PKWY., NO. 207 ● MISSION VIEJO, CA 92691 ● (714) 768-1551

\$\$ SAVE MONEY ON YOUR \$\$ CASSETTE & DISC SUPPLIES

We buy cassettes and discs in large quantities for our own use and can pass the savings on

C-10 Cassettes w/labels .59 ea 10 for \$5.50 Cassette storage box .25 ea 10 for 2.00

High quality, nationally advertised brand. Guaranteed Performance! We will replace any disc that fails during normal use. Discs are single sided, double density, reinforced hub with Tyvek sleeve. \$2.25 each 10 for \$19.95

ROMS

Basic 1.2	5
Extended 1.1 w/manual	5
Disc 1.1	5

NEED MORE MEMORY? 64K Memory Expansion Kit

All parts and complete instructions (For 'E' and 'F' boards and CoCo II)

COCO DISC DRIVES

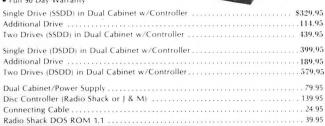
- · Hi-Quality Teac Thin Line Drive
- · Attractive, Beige Dual Drive Cabinet/Power Supply
- Fill Panel for Single Drive Disc Systems
- · Radio Shack or 1 & M Controller
- · Cable and Operating Manual
- Full 90 Day Warranty

CASSETTE

\$24.95

DISC

\$27.95





The combination of exciting game-play action and colorful, hi-res graphics in Zookey make it an outstanding typing tutor. Speed and skill levels are fully adjustable to train the beginner or challenge the most experienced typist.

Stimulating for both youngsters and adults...Ideal for classroom or individual instruction.

SEN'SUPER BUG



Mark Data Products SUPER BUG is a powerful, relocatable machine code monitor program for your CoCo. If you are a beginner, the program and documentation are an indispensable training aid, helping you to gain a better understanding of your Color Computer and machine code programming. If you are an accomplished computerist, SUPER BUG'S capabilities, versatility and convenience will prove invaluable during programming and debugging.

SUPER BUG offers so many outstanding features that we are unable to list them all in this limited space but here are a few: hex and alpha numeric memory display, modify, search, and test; full printer support with baud rate and line feed select; up to 220 breakpoints; mini object code disassembler; 64K mode setup; decimal, hex and asci code conversion routines and extensive documentation.

Tape \$29.95

Disc \$32.95

INFORMATIVE BOOKS

"Your Color Computer" by Doug Mosher

Over 300 pages of detailed information...an indispensable introduction to your Color Computer, complete with diagrams, photographs, and a BASIC thesaurus and command reference section. A CoCo encyclopedia.

"Programming the 6809" by Rodney Zaks

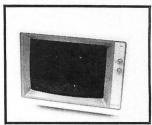
One of the best machine language texts available—required reference material. This book explains how to program the 6809 in machine language, covering all aspects progressively and systematically.

JALITY VIDEO MONITORS



SAKATA COLOR SC-100- \$269.95

The SC-100 is a streamlined 13" composite monitor which produces sharp, brilliant colors. The cabinet is made of durable styrene and is available in an attractive off-white color. Includes audio with speaker and earphone jack. We highly recommend this color monitor because of its excellent performance and beautiful styling.



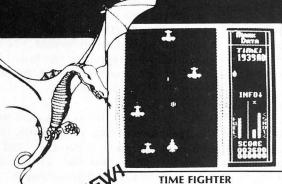
TAXAN AMBER SCREEN- \$129.95

A 12" amber screen composite monitor of the highest quality with exceptional reliability and performance. 18 MHZ bandwidth. Attractive off-white cabinet. We use this monitor in our

VIP SOFTWARE

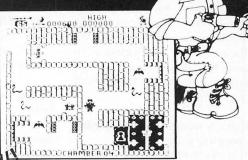
We carry the most asked for softlaw products for your convenience

PER NEW GAMES!



Pilot your MD-64 fighter through a hazardous time tunnel. Your mission is to destroy the dreaded Time Guardian who threatens the natural order of the universe. In order to reach this menace you must fight aerial dangers from strange and different time zones. If you like fast action, this one's for you! 16K required.

Rainbow, March '84 "One of the best in your library of computer games. It's a real gem.



TUT'S TOMB

Explore the ancient, mystical tomb of the great Pharoah. Find the magical keys which lead you to unbelievable treasures as you out-maneuver the creatures that slither and swarm about you. Super fast arcade action-this one will knock your socks off with 16 screens of incredible color and sound. Fabulous! 32K required.

Hot CoCo, April '84 "State of the art CoCo graphics. A first rate game.

CASSETTE \$24.95

DISC \$27.95

Mark Data Products

Disk



In making the most of your time, this program could be the solution

PERT: Project Evaluation and Review **Technique**

By Jorge Mir

aving the ability to evaluate and review projects can be very Luseful, at the office as well as at home, especially when time is of the essence and you want to make sure that projects are completed on time with a minimum of supervision.

There are many types of "PERT" programs available on the market. Some of these are quite sophisticated (and expensive) and require a large mainframe in which to operate. The PERT version I have developed for the Color Computer is a simple one, yet it has sufficient "bells and whistles" to make it quite beneficial at work.

Following are the main features of the *PERT* program:

- 1) Calculates minimum time needed to complete project.
- 2) Calculates probability of completion by a target date.
- 3) Determines whether activities are critical or non-critical.
- 4) Calculates expected duration and

standard deviation for each activity.

- 5) Determines early and late start and finish times.
- 6) Calculates slack time for each activity (if any).

In addition, several output reports are available:

- 1) Worksheet for developing a precedence table.
- 2) Complete activity schedule.
- 3) Activity schedule by responsibility.
- 4) Complete Gantt type schedule.
- 5) Gantt schedule by responsibility.

The activity and Gantt schedules both clearly indicate the "critical" activities so the user can concentrate on evaluating those activities, as well as monitoring progress, as the project advances through the various stages of completion.

The program is fully prompted for all input data, so these will not be covered in detail. The input and output routines send data to a disk. If you have a cassette system, you will have to change those routines so data is saved to cassettes instead of disks. Also, a

printer is necessary for the various output reports.

Please note that a total of 100 activities is the maximum established by the program. This limitation can be changed by changing the DIM statements at the beginning of the program.

In order to properly enter all data, a precedence table (which activity comes before another activity) is necessary. After you enter all of the activities, you will be able to develop a worksheet for this purpose. After you have the worksheet completed, you can then run the program in its entirety.

Here are some hints for properly completing the worksheet:

A "node" can be viewed as a stage in the project. That is, at which stage an activity must commence and at which stage it must end. These nodes serve as the key for determining the rest of the calculations in the program, so care should be exercised in planning this aspect of the project.

The start node of each activity must appear as the end node of some other activity in the project. In other words, all activities must be linked with each other (exceptions are those activities

(Jorge Mir is a certified public accountant and controller of a Fortune 500 Corporation. He publishes most of his original work through THE RAINBOW.)

GUARANTEED

SPECTRAL ASSOCIATES HAS PRODUCED THE HIGHEST QUALITY COLOR COMPUTER ARCADE GAMES FOR MORE THAN THREE YEARS. RADIO SHACK HAS LICENSED MANY OF OUR GAMES — HOW MANY OTHER ALLEGED "ARCADE GAME MANUFACTURERS" CAN SAY THAT? SPECTRAL IS THE STANDARD OF EXCELLENCE AND WE STAND BEHIND OUR PRODUCT, IF YOU ARE NOT 100% SATISFIED BY OUR ARCADE GAMES, RETURN THE GAME WITHIN 10 DAYS FOR A FULL REFUND.

DISK DRIVES 320K — \$175°

Amazing, but true. Now you can get 320K bytes of double-sided disk storage for \$175*. Latest technology half-high disk drive which may be configured as two single-sided drives by software or used as a double-sided drive under FLEX. 100% compatible with TRS-DOS and all hardware versions of the Color Computer.

*case and power supply extra

32K/64K UPGRADES

Upgrade your Color Computer from 4K/16K to 32K/64K and realize the full potential of your computer. Only the CoCo II upgrade requires soldering. Complete, easy-to-read instructions for all CoCo Versions after the D board.

\$49.95 MACHINE LANGUAGE

So you want to learn the guts of the CoCo, but it costs too much - NOW IT DOESN'T! Look what you get for \$99.95.

\$ 49.95
19.95
19.95
14.95
59.95
\$

A \$164.75 value for \$99.95 \$164.75 BASIC PROGRAMMING TRICKS REVEALED

Basic programming tricks revealed contains everything you need to know to vastly improve your Basic programming skills. It includes several, never before published, practical examples and explanations of how to use PEEK, POKE, AND, OR. NOT, VARPTR and several other obscure commands. Also included are many useful ways to fool Basic into doing some very powerful things that it normally wouldn't do. Several tricks for Basic, Extended Basic and Disk Basic are all contained in this informative and useful book

\$14.95

EXPRESS ORDER!

ORDER BY VISA OR MASTERCARD AND YOUR ORDER WILL BE SHIPPED WITHIN ONE BUSINESS DAY - GUARANTEED OR YOU GET THE GAME FREE!! HARDWARE ITEMS SUBJECT TO MANUFACTURERS

is fast, get FLEX+.

NO COD ORDERS WA residents add 7.8% tax SHIPPING AND HANDLING \$59.95

ADD 3%, \$2.00 minimum

CANADA ADD 6%, \$3.00 minimum FOREIGN ADD 15%, \$5.00 minimum

FREE ORDER LINE

ARCADE TOP 10

Listed below are the 10 most popular Color Computer games as of SEPT 10:

1. LANCER	6. CUBIX
2. CRYSTAL CASTLES	MS. GOBBLER
3. PENGON	8. BUZZARD BAIT
4. GALAGON	9. DEVIOUS
5. QIKS	10. BLOKHEAD

ARCADE QUALITY	GAME	S	Cassette Price
Allond a derial.			Disk add \$3.00
LANCER (JOUST)	32K	ML	24.95
LUNAR ROVER (MOON PATROL)	32K	ML	24.95
GALAGON (GALAGA)	32K	ML	24.95
MS. GOBBLER (MS. PAC MAN)	32K	ML	24.95
PLANET INVASION (DEFENDER)		ML	24.95
WHIRLYBIRD RUN (SCRAMBLE)		ML	24.95
CUBIX (Q*BERT)	32K	ML	24.95
GALAX ATTAX (GALAXIANS)		ML	24.95
COLOR PANIC (SPACE PANIC)	32K	ML	21.95
COSMIC INVADERS (SPACE INVADERS)		ML	21.95
PENGON (PENGO)		ML	24.95
DEVIOUS (XEVIOUS)	32K	ML	21.95
FROGGIE (FROGGER)	32K	ML	24.95
QIKS (QIX)	32K	ML	24.95
STORM ARROWS (TARG)		ML	21.95
ANDROID ATTACK (BERZERK)		ML	24.95
DEFENSE (MISSILE COMMAND)		ML	24.95
GHOST GOBBLER (PAC MAN)		ML	21.95
SPACE RACE (OMEGA RACE)		ML	24.95
CRYSTAL CASTLES (ICE CASTLES)	32K	ML	24.95
COLOR ZAP (SPACE ZAP)		ML	14.95
SPACE SENTRY (STAR TREK)		ML	21.95
STAR SPORES (FIGHT ALIEN INVADERS)	32K	ML	21.95
BEAM RIDER (ORIGINAL STRATEGY GAME)		ML	24.95
SPACE WAR (INTERPLANETARY COMBAT)		ML	21.95

SPECIAL — Buy 2 get 10% off.

COLOR BASIC UNRAVELED

Color BASIC 1.2/Ext. BASIC 1.1/ Disk BASIC 1.1"

FULLY COMMENTED - NO HOLES

ALL FCBs, FDBs and FCCs defined.
COMPLETE MEMORY MAP - no missing spaces, every-

thing is defined.

PROGRAMMING TRICKS EXPLAINED

EASY TO UNDERSTAND MOST RECENT ROM VERSIONS

COLOR BASIC UNRAVELED EXTENDED BASIC UNRAVELED DISK BASIC UNRAVELED

\$19.95

\$19.95

WITH Editor Assembler

All 3 for \$49.95

SPECIAL

The premier DOS at an unbelievable price — only \$39.95. Shop

around, if you want a version of FLEX which doesn't crash and

AVAILABILITY.

3418 SOUTH 90th STREET TACOMA, WA 98409

ORDERS ONLY 800 426 1830 ORDER PROCESSING AND INFORMATION 206 581 6938

000000000000

with a node of '1', meaning they are to be performed first and no other activity precedes it).

More than one activity can have the same start or end nodes; just make sure the beginning node of an activity coincides with the ending node of the activity that must precede it. Here is a simple example (cooking a meal):

	Start Node	End Node
Buy all ingredients	1	2
Marinate meat	2	3
Wash vegetables	2	4

Bake potatoes	3	5
Broil meat	3	6
Cook vegetables	4	6
Serve meal	6	7

In the example, you cannot broil the meat (start node 3) until the meat is marinated (end node 3). Also, this project may require two people since there are two activities starting at the same node (i.e., one marinating the meat and the other washing the vegetables).

If there is a start node which does not coincide with an ending node in one of the other activities, the program will stop execution and inform you of those activities for which starting nodes must be changed.

The best way to get used to the program is to run some simple examples, as the one noted. That way, you will get a good feel for all the prompts for inputting data and all of the output reports, as well as the various ways in which a program of this nature can be put to good use.

I often get involved in some complex projects at work and have used this program many times to help me keep control of such projects. Take my word for it, it really helps!

160 108 320 65 480 232 940 95 1210 24 1480 87	1660 201 1780 6 2040 108 2220 167 2370 228 2490 71 END 210
--	--

The listing:

10 GOTO 2680

20 CLEAR 10000

30 DIM A\$(100),R\$(100),A(100,2),

S(100),F(100),E(100,2),C(100)

40 DEFFNR(Z1)=INT((Z1*1000+.5))/ 1000

50 GOTO 1530

60 GOSUB1540: PRINT"HAVE ACTIVITI STORED ON DIS ES ALREADY BEEN

K?"

70 I = INKEY : IF I = "THEN 70 ELSE IF I\$<>"Y" THEN PT=0:GOTO150 EL SE PT=1

80 GOSUB1540: PRINT"PLACE DISK CO NTAINING PREVIOUSLYSTORED ACTIVI TIES IN DRIVE Ø ANDPRESS ANY KEY WHEN READY."

90 IF INKEY\$=""THEN90 ELSE PRINT :PRINT"LOADING DATA...."

100 OPEN"I",#1,"PERT.ACT"

110 INPUT#1,PT\$

120 IF EOF(1) THEN 140

130 N=N+1:INPUT#1, A\$(N),R\$(N):G OT0120

140 CLOSE#1:GOTO250

150 GOSUB 1540:PRINT"TITLE OF TH IS PROJECT: ":LINE INPUT PT\$

160 PRINT

170 PRINT"DESCRIBE ACTIVITIES IN

CLUDED IN THIS PROJECT." 180 PRINT"TYPE 'END' WHEN DONE."

:PRINT: A=PEEK (%H88) *256+PEEK (%H8 9)

190 PRINT@A-&H400, "ACTIVITY NO."

:N+1:CHR\$(8)":":PRINT:PRINT:PRIN T:PRINT@A-&H400+32,;:LINE INPUT A\$

200 IF AS="ERROR" THEN N=N-1:GOT

210 IF A\$="END" THEN 250

220 N=N+1

230 I=INSTR(A\$,"/"):IF I>0 THEN A*(N) = LEFT*(A*, I-1):R*(N) = MID*(A\$,I+1) ELSE SOUND100,2:N=N-1:PRI

NT@A-&H400, "ENTER '/' PLUS RESPO NSIBILITY!":FOR Q=1T0500:NEXTQ:S

OUND100,2:GOTO190

240 GOTO 190

250 GOSUB 1540:PRINT"DO YOU WANT

TO PREPARE WORSHEET TO DEVELOP A PRECEDENCE TABLE?"

260 I\$=INKEY\$: IF I\$=""THEN 260

270 IF I\$<>"Y" THEN 520

280 IF PT=1 THEN PT=0:GOTO380

290 GOSUB 1540:PRINT"DATA MUST B E STORED BEFORE WE PROCEED."

300 PRINT: PRINT"PRESS ANY KEY WH

EN YOU HAVE A DISK READY FOR S TORING DATA."

310 IF INKEY\$=""THEN310

320 OPEN"O",#1,"PERT.ACT"

330 WRITE#1,PT\$

340 FOR X=1TON

350 WRITE#1,A\$(X),R\$(X)

360 NEXT X

370 CLOSE#1

380 GOSUB 1540

390 PRINT"PLEASE GET PRINTER REA DY FOR PRINTING ACTIVITY WORK

SHEET."

400 PRINT: PRINT"PRESS ANY KEY WH EN READY."

410 IF INKEY\$=""THEN 410

420 PRINT#-2, "PROJECT: "PT\$

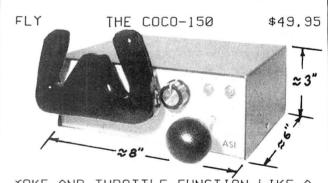
430 PRINT#-2:PRINT#-2

440 PRINT#-2."

NODES

```
TIMES"
450 PRINT#-2."
460 PRINT#-2,"
                          ACTIVIT
IES
                        START
                                F
        BEST
               PAR
                     WORST"
470 PRINT#-2,"----
480 FOR X=1TO N
490 PRINT#-2:PRINT#-2,USING"###
    ----";X,A$(X)
500 NEXT X
510 PT$="":GOTO 1530
    *** ENTER DATA
520
530 FOR I=1 TO N
540 IF A(I.1)>0 THEN 800
550 GOSUB1540
560 PRINT A$(I):PRINT
570 PRINT"START NODE":
580 INPUT A(I.1)
590 IF A(I,1)<0 THEN I=I+A(I,1):
GOT0550
600 PRINT"END NODE":
610 INPUT A(I,2)
620 IFA(I,2)>=A(I,1) THEN 680
630 IF A(I,2)<N THEN 680
640 PRINT" START NODE MUST BE NU
           LOWER THAN END NODE.
MBERED
           NODE MUST BE LESS THA
AND END
           OF ACTIVITIES."
N NUMBER
650 PRINT" *** TRY AGAIN
660 PRINT
670 GOTO 550
680 PRINT"ENTER THREE TIME ESTIM
          THIS ACTIVITY: "
ATES FOR
690 PRINT"
             OPTIMISTIC TIME: ";
700 INPUT A1
710 PRINT"
               EXPECTED TIME: ":
720 INPUT M
730 PRINT" PESSIMISTIC TIME: ";
74Ø INPUT B
750 E(I,1)=FNR((A1+M*4+B)/6)
760 E(I,2)=FNR((B-A1)/6)^2
770 S(I)=0
78Ø F(I)=Ø
790 IF FLAG=1 THEN FLAG=0:RETURN
800 NEXT I
810 FOR I=1 TO N
820 IF S(A(I,2))>=S(A(I,1))+E(I,
1) THEN 840
830 S(A(I,2))=S(A(I,1))+E(I,1)
840 NEXT I
850 F(A(N,2))=S(A(N,2))
860 FOR I = N TO 1 STEP -1
870 IF F(A(I,1))=0 THEN 900
```

880 IF F(A(I,1))>F(A(I,2))-E(I,1) THEN 900 890 GOTO 930 900 IF F(A(I,2)) < S(A(I,1))+E(I ,1) THEN F(A(I,2))=S(A(I,1))+E(I ,1) 910 Q=F(A(I,2))-E(I,1):IF Q=>0 T HEN F(A(I,1))=Q920 IF F(A(I,1))=0 THEN F(A(I,1))=S(A(I,1))930 NEXT I:GOTO 1430 940 V=0:U\$="% % - ### ###" 950 C=0 960 L=0 970 FOR I= 1 TO N:CLS 980 S1=F(A(I,2))-S(A(I,1))-E(I,1): IF INT(S1) = < 0 THEN C(I) = 0 ELSE C(I) = S1990 CLS: IF LEN(PT\$) =>32 THEN PRI NT PT\$ ELSE PRINT TAB((32-LEN(PT 李))/2)PT\$ 1000 PRINT STRING\$ (32.131): 1010 PRINT A\$(I):PRINT 1020 PRINT"FROM NODE"; A(I,1)"TO NODE"; A(I,2) 1030 PRINT "(A "; 1040 IF C(I)=0 THEN 1060



YOKE AND THROTTLE FUNCTION LIKE A 'REAL' AIRPLANE - HAS 'RUDDER' CONTROL KNOB AND 'FIRE' BUTTONS.

> SPECIAL COMBO OFFER
> TOM MIX 'WORLDS OF FLIGHT'(WOF) + COCO-150 \$72,95(T)/\$75.95(D) OR

ASI-IFR FLIGHT SIMULATOR - THE MOST VALID HOME COMPUTER INSTRUMENT FLIGHT SIMULATOR PROGRAM WE KNOW OF FOR PRACTICING IFR NAVIGATION AND APPROACHES USING CURRENT ACTUAL FAR MAPS AND APPROACH PLATES. PROGRAM ALLOWS QUICK AND EASY CUSTOMISING TO YOUR LOCAL AREA AND UPDATES AS YOUR LOCAL FAA CHARTS CHANGE, PRICE INCLUDES COPIES OF OFFICIAL FAA FLORIDA SECTIONAL AND 6 ILS APPROACH PLATES, INSTRUCT-IONS, KEYBOARD DUERLAY, AND 8 1/2 BY 11 LODSELEAF BINDER. COCO-150 OR JOYSTICKS REQUIRED + 16K OR 32/64K EXT. COLOR BASIC (SPECIFY). ASI-IFR #15.95 (TAPE DNLY)

ASI-IFR + COCO-150 \$59.95 (TAPE DNLY)

EVERYTHING PACKAGE - COCO-150 + WOF(T) + ASI-IFR(T) COCO-150 + WOF(D) + ASI-IFR(T) +85.95 ADD #3.50 POSTAGE AND HANDLING - FLA. RESIDENTS ADD 5% SALES TAX. FOR ASI-IFR DNLY ADD \$1.50 P&H AND 5x FLA. TAX IF APPLICABLE.

> ALBAN SCIENTIFIC, INC. P.O. BOX 15226 DAYTONA BEACH, FLORIDA 32014

> > CALL 904-252-5302

Get Organized for 1985

HARDWARF



DISK SYSTEMS

The biggest investment you'll make in your computer system will be a disk system. It will widen your computing horizons considerably and should be chosen carefully. Computerware configures systems to include the most reliable components at the best prices available. We do not try to be the cheapest by

We offer complete systems assembled and tested by expert technicians. We've been selling disk systems since 1977 so we know what you need and we make sure you get it! We use the highest quality components including TEAC and Hitachi drives. J & M Systems controller, all GOLD connectors, heavy duty cabinet, power supply, and cable. Our power supplies are totally adequate to insure reliability; we know dual drives need heavier power supplies! All of our TEAC and Hitachi drives come with a 6ms step rate, full 40 tracks, slim line size, and a one year warranty. In addition to the DOS manual, you receive a 20-page technical manual documenting every detail of disk drive performance and specification.

Also available from Computerware is the new Amdisk. Compatible with Radio Shack Drive O. it is perfect for adding extra storage. Our software is available on Amdisk format for only \$4 extra. (Remember every Amdisk cartridge is equivalent to two floppy diskettes.)

DISK SYSTEMS

Include J & M Controller, DOS Manual, cabinet, power supply, half-size double density drive, & all cables (Prices quoted for JDOS, Add \$10 for RSDOS.)

Single drive. Single sided Dual drives. Single sided Single drive. Double sided \$399.00 Dual drives. Double sided \$599.00

ADD ON DRIVES

Each drive add-on includes half-sized drive(s) in cabinet with extender

Single drive. Single sided	\$229.00	J & M Controller	
Single drive. Double sided	\$269.00	with JDOS	\$130.00
Dual drives. Single sided	\$399.00	with RSDOS	\$140.00
Dual drives. Double sided	\$469.00		

AMDISK III

Complete Dual Drive System including controller, cable & manual

(Price quoted for JDOS, Add \$10 for RSDOS.)

\$499.00 \$375.00

Dual Drive and cable only.

DISKETTES

Computerware double density diskettes with hub rings are of the highest quality. We love them and so will you!

5 pak \$10.95

10 nak \$19.95

Amdisk cartridges \$5.50 each

NEW! IMPROVED! HIGHER RESOLUTION

We proudly introduce a new model of our popular NAP monochrome monitors with higher resolution and a more compact stylized case. Of course they will have the built-in audio - no need to add expensive amplifier or go without sound

NAP Green Screen \$109.95

NAP amber screen \$114.95

Color with audio \$275.00

PUT A MONITOR ON YOUR COCO WITH VIDEO PLUS!

Yes! You can enjoy the crisp display of a composite video monitor using Computerware's Video Plus interface. Each is fully assembled and tested. Installation is quick, easy, and requires no soldering. Your TV output is not disabled. Audio output available. Choose the model right for your computer and

Interfaces the original model of Color Computer to any composite video monitor (color or monochrome).

\$26.95

Interfaces the CoCo II with a monochrome composite video monitor

\$34.95

Interfaces the CoCo II with any composite video monitor (color or monochrome)

\$34.95 Interfaces the new CoCo II (model with power switch next to the TV output and chips soldered, not socketed) with any composite video monitor (color or monochrome).

SOFTWARE

BUSINESS APPLICATION

- They have been in use for over 4 years on many 6809 systems. This means they are well tested
- · Complete manuals accompany the systems
- · User-friendly menus make them easy to use

System Requirements

· 64K memory

· Dual Disk Drives (Payroll requires double-sided drives)

GENERAL LEDGER

This is a comprehensive double entry accounting system with complete audit trails, closing procedures, and full reporting. The chart of accounts is flexible and the system easy to use. Reports include the General Ledger, Trial Balance, Balance Sheet, Income Statement, and Transaction Register Your financial information is at your finger tips!

CHECK LEDGER

This is a single entry bookkeeping system which allows the user to define a chart of income and expense accounts. Year-to-date totals are maintained for each account as well as complete checking account history. By just entering your checking account information, you can have always-current visibility over your income and expense ledgers. Financial statements and taxes are a snap!

INVENTORY CONTROL

This system is designed to help the retailer, distributor, or businessman to keep control of this important factor. It stores your cost and quantity information, updates it immediately, and offers your key management reports with useful summaries at any time. With four costs, four locations, selling history, and vendor information for each item, you will always have the facts!

PAYROLL

This is the most comprehensive payroll you'll find on a microcomputer. Besides collecting key employee information, it allows entry of pay rates for standard hours, overtime, and salary. Hourly, salary, and commissioned employees may be paid weekly, bi-weekly, semi-monthly, and monthly. Two types of special monthly deductions are also accommodated. Year-to-date, quarterly, monthly and current totals are maintained. All federal reporting is done automatically and your state computations \$175.00

ACCOUNTS PAYABLE

This system can give you the tools to plan your business' growth by controlling expenditures and forecasting cash requirements. It helps a small business manage and track its cash liabilities by collecting vendor invoice information and reporting the business' cash commitments and payment history. Along with standard payables reports it also includes a check writer and payment forecast \$125.00

ACCOUNTS RECEIVABLE

All businesses need to know who owes them money! This system provides reliable and timely information regarding the status of all customer accounts. You can know instantly which accounts are past due, forecast how much money to expect to receive for cash flow planning, and keep on top of your customers' credit positions. Customer name, address, credit limit, invoice, and payment information is recorded and reports of all information including customer statements are available upon your request

\$125.00

PERSONAL FINANCE SYSTEM

The Personal Finance System makes it fun and easy to organize, control and understand your personal finances. It's many programs in one. It balances your checkbook. It compares your actual expenses with your budget. It gives you a personal financial statement of income and expenses with your own accounts. It has many reports to let you "see" where your money is coming from and going to It can make tax time much easier with convenient financial summaries. It includes a special investment and loan module that helps you calculate all the details like mortgage payments, principal amounts. amortization tables, interest rates and more so you can analyze your current and future investments quickly and easily. With PFS you will not only keep your finances organized but can do important planning and analysis as well. So start 1985 right with your own Personal Financial System! (Requires 32K Extended Basic with 1 Disk Drive and an 80 column printer) \$27.95

COCO COOKBOOK

- · Can be used for ANY free-format filing system (not just recipes). Try it for periodicals and article synopsis, product reviews, real estate descriptions
- · Store & retrieve a large number of recipes
- Up to 270 recipes on a single disk using a special compression technique
- . Up to 3040 characters per recipe including title, ingredients & instructions - all in easy to use "free form" format
- · Access each recipe by title, number, or with special keyword search (like all the recipes using 'chicken!") List on the screen or printer.
- 50 recipes included FREE!
- · Requires 32K and a disk drive

32K disk \$27.95



vitb COMPUTERWARE

DATA BANK

for OS-9 and other 64K users

If you want a data base that does it YOUR WAY, then DATA BANK is the data management system for you! With DATA BANK, you are the boss. You define your own display screens, record formats calculated fields, sort sequences, selection criteria, and report formats. Even with all its power Data Bank is very easy to use! It goes several steps beyond the average data base by adding features like calculated fields, three level sorts, easy interface with DynaCalc, and special file manipulation utilities

STORING YOUR DATA - the way YOU want to see it!

Remember, with Data Bank you determine how your information is stored and displayed. You can design up to 9 different screen formats for display, making data entry and retrieval simple. Each record can contain up to 512 characters in up to 35 fields, ample for nearly every application. Data types include alphanumeric (for strings of all kinds), math (for real numbers), date, and "derived" (values calculated by your own defined formulas)! These derived formulas can use values from other fields and mathematical functions. There isn't anything you can't store with these formats! The size of your data base is limited only by your disk space; and you can maintain multiple data bases on the same disk Expansion of record files is made very easy with sophisticated file manipulation utilities. You can also transfer data between files - all records or selected subfiles, which is handy for revising record layouts!

SORTS & SELECTIONS - organizing your data

To aid in sorting and selecting, you can define up to 9 different "access keys," each with up to 3 levels These access keys are used for accessing a specific record, sorting an entire file, or selecting subsets of files. The generic search will find any occurrence of a given value in a key field throughout the data base. Using logical operators (less than, greater than, equal, or, and) you can select any subset of your data base for printing. All or any selected subset of records can be sorted in order. You can organize your data in any way you can think of

REPORTING - all the right stuff!

Printing your information in a format useful to you is the most important function of a data base system Data Bank allows you to design customized reports to fit your individual needs and can save up to 9 defined formats for repeated use. You may include page headings with titles, automatic page numbers. column headings, totals for numeric fields, and more. Reports will print to the output path you specify and use any of your pre-defined access keys.

SPECIAL FEATURES

Data Bank offers even more with

- · Access to all OS-9 commands from the program
- Reads DynaCalc OS-9 files
- · Easy access to user programs
- · OS-9 not required

64K Disk \$79.95



This is the most comprehensive and flexible data management system available. It is easy to use and very powerful. (Requires 32K disk & RSDOS.)

Collect up to 35 fields per record, with up to 240 characters per record. You designate the name of each field, its position, and its format. (alphanumeric, numeric, money, date or exponential). The size of your data base is unlimited - only your disk space will limit your files

Organize your way. You determine how the information is displayed and stored by designing your own entry screens. Your format can be changed any time. Easy screen definition makes data entry simple. The quick assembly language keyboard routine insures that you can't type faster than Flexi Filer!

Select, using logical operators (less than, greater than, equal, and, or) any subset of your data base with up to 36 different criteria. A generic search feature finds any occurrence of a given string in the key field throughout the data base!

Sort all or any selected subset of records in ascending or descending order by any of your 35 fields with a very FAST assembly language sort!

Design customized reports and labels to fit your individual needs, including page headings with titles. automatic page numbers, and column headers. Store up to 10 often-used formats. Numeric fields can be totaled automatically for summaries. Printing your information in the format most useful to you is a snap! And you can set the baud rate for faster printers too. Reports will print to the printer or screen.

A File Manager with sophisticated file manipulation is the sign of a true data base manager. With Flexi Filer you can archive and/or delete records via selected sub-files. (For example, archive records with an old date into a separate file and delete them from your working data disk. This frees up disk space without losing important data.) You can also transfer data between files - all records or selected sub-files. This is handy for adding fields to old database layouts or revising records without re-entering data! Also included is password protection, automatic expansion of record files, and easy access to user programs

Disk \$54.95



MERGE 'N MAIL

Merge 'n Mail was specially designed to do one job and do it very well - maintain, merge, and print mail list information. Mail 'n Merge is perfect for clubs. Christmas card lists, newsletter writers, party givers, or anyone with a personal address file for relatives, doctors, insurance agents, emergency numbers

A lot of information is stored. The eight preset fields include Last Name. First Name. Company Name. Address, City, State, Zip-Code, and Phone Number, Twelve additional programmable fields allow you to store extra information according to your personal needs. Names are automatically sorted by last name when entered, so no special sort is needed. A zip-code sort is also available. Merge 'n Mail can store over 2500 records per file; over 800 is possible on a single drive; the files may be on 1-4 drives.

Look-up is easy and fast. Logical selection allows you to search for records by any field with six different qualifiers. The binary search algorithm makes access very fast. The unique "soundex search" feature lets you look for a name without knowing how to spell it correctly - just type what it sounds like!

Printing is a snap! Label formats are easy to specify at print time or your own custom label formats may also be saved and loaded from disk. Labels and listings may be sorted by name or zip-code. The logical selection feature allows you to specify a subset of your mailing list by any field with six different qualifiers for printing. Printer baud rate, compression and uncompression codes may be changed and saved to disk to tailor it to your personal printer.

The mail-merge feature is especially useful. You can create letters with your word processor and embed mailing list info automatically! It can be used with any ASCII editor including Scribe. Telewriter. Scripsit, and Super Color Writer II.

Mail in Merge is sophisticated yet easy to use. If you maintain a mailing list for any purpose, this is a tool that can save you time! It requires 64K and one disk drive and sells for a very reasonable price

> 64K disk \$27.95



DON'T FORGET!

Personal Time Management System and Event Recorder with Memos

You won't forget Don't Forget! You'll actually enjoy getting organized with this personal time management systems. The Macintosh-like icons make entering your personal schedule simple and fun But if you need instructions, there are help screens to assist you

You'll never miss a birthday or important appointment again! With Don't Forget! you can record the entire year's occasions and daily appointments ahead. Each day has spaces for 4 Special Occasions. 2 Memos, and hourly notes for 6 am through 9 pm. The built-in 51 × 24 upper and lower case hi-res display makes it very easy to read. You can display or print any daily schedule - or a whole week at a time - so you'll remember every important event. You can even print a blank monthly calendar page with big boxes to scribble notes in!

So use your CoCo's memory and Don't Forget! as your personal secretary. Designed for mouse. joystick, or keyboard entry. Don't Forget! requires 32K and one disk drive

Computerware is a federally registered trademark of Computerware*.

			-					
		•		COM	APU1	ERW	/ARE	R
Call	or Wri	te to:					(619) 43	36-3512
				Box	668 •	Encinita	s, CA	92024

Address				
			State	Zip
Yes! Send	d me your FREE car	talog! 🗌		
VISA	MasterCard	Check	COD)
Card #			Exp	
Signature _				
	ltem		Format	Price
Shipping:		6% Ca	lif. Sales Tax	
Surface - \$	2 minimum.		COD Add \$5 _	
2%	for orders over \$100		Shipping* _	
Air or Canad	a — \$5 minimum.		TOTAL _	
50%	for orders over \$100			

Checks are delayed for bank clearance

Canadian Dealer Distributor: Kelly Software P.O. Box 11932 Edmonton, Alberta T5J3L1

1050 PRINT"NON-": 1060 PRINT"CRITICAL EVENT) ": PRIN 1070 PRINTUSING U\$: "EXPECTED DUR ATION", E(I,1): PRINTUSINGU\$; "STD. DEVIATION", SQR(E(I,2)) 1080 IF INT(S1)>0 THEN 1150 1090 PRINTUSINGUS; "START NO LATE R THAN",S(A(I,1))1100 PRINTUSING U\$; "MUST COMPLET E BY",F(A(I,2))1110 IF L>=F(A(I,2)) THEN 1130 1120 L=F(A(I,2))1130 V=V+E(I,2) 1140 GOTO 1190 1150 PRINTUSING U\$; "EARLY START" ,S(A(I,1)):PRINT USINGU\$;"LATE S TART", F(A(I,2))-E(I,1)1160 PRINT USING Us; "EARLY FINIS H",S(A(I,1))+E(I,1)1170 PRINTUSINGUS; "LATE FINISH". F(A(I,2)) 1180 PRINT USING U\$; "SLACK TIME" , 51 1190 PRINT@448,STRING\$(32,140);; PRINT@484,"PRESS ANY KEY TO CONT INUE";

PICOSOFT STRATEGY GAMES

1200 I = INKEY : IF I = "THEN 1200



THE SPANISH ARMADA

Simulates the problems faced by the English Commanders in 1588 as they struggled to defeat the ARMADA.

Cope with fickle winds. A relentless current. Difficulty of supply. \$24.95

DEBACLE

Command an 18th century army in the opening campaign of the French and Indian War. Build a road through the wilderness. Establish supply lines. Cope with Indian attacks. Capture a frontier fort. \$24.95



FEUER AND GASSE



Lead the American 2nd Division in a counter offensive against von Ludendorff's final drive on Paris in 1918. Recreates the battles of Belleau Wood and Chateau Thierry. Plays in real time. \$24.95

All games require a 32K computer and are graphically portrayed using the semi-graphics 4 mode to depict the battle maps. Tape and Disk compatible. Games are shipped on tape.

Send check or money order to PICOSOFT GAMES, P.O. BOX 35, EIGHTY FOUR, PA 15330; (412) 267-3721. Games are shipped postage paid. PA residents add 6% Tax. No delays for personal checks.

1210 IF I\$=CHR\$(13) THEN 1530 1220 NEXT I 1230 GOSUB1540 1240 PRINT"THE CRITICAL PATH LEN GTH IS: ":L 1250 P=SQR(V) 1260 PRINT"PLUS OR MINUS";:PRINT USING" # ###" P 1270 PRINT"ENTER DESIRED COMPLET ION TIME (Ø TO END)"; 1280 INPUT D 1290 IF D<=0 THEN 1530 1300 Y=(D-L)/P 1310 R=EXP(-(Y^2)/2)/2.506628274 1320 Z=Y 1330 Y=1/(1+.33267*ABS(Y))1340 T=1-R*(.4361836*Y-.1201676* Y^2+ . 937298*Y^3) 1350 IF Z>=0 THEN 1370 1360 T=1-T 1370 GOSUB1540 1380 PRINT 1390 PRINT USING "PROBABILITY OF COMPLETION WITH DURATION OF ## # IS ##.##"; D, T 1400 PRINT 1410 GOTO 1270 1420 CLS: END 1430 PRINT: PRINT" EDITING STARTI NG TIMES...." 1440 FOR I = 1 TO N 1450 IF S(A(I,1))>0 THEN 1490 1460 IF A(I,1)=1 THEN 1490 1470 IF XX=0 THEN GOSUB1540:PRIN T"THESE ITEMS NEED EDITING: ": XX= 1480 PRINT " ":A\$(I) 1490 NEXT I: XX=0 1500 PRINT@480." <PRESS ANY KEY TO CONTINUE>"; 1510 IF INKEY\$=""THEN1510 1520 GOTO 1530 1530 GOSUB 1540:GOTO1560 1540 CLS: PRINT TAB(10) "* P E R T 1550 PRINT" (PROJECT EVALUATION & REVIEW) ": PRINT STRING \$ (32.131) : RETURN 1560 PRINT: T=5 1570 PRINT TAB(T)"1 - ENTER NEW PROJECT" 1580 PRINTTAB(T)"2 - LOAD OLD PR OJECT" 1590 PRINTTAB(T)"3 - SAVE DATA" 1600 PRINTTAB(T)"4 - EVALUATE PR OJECT" 1610 PRINTTAB(T)"5 - PRINT RESUL

1620 PRINTTAB(T)"6 - PRINT GANTT RENTLY IN MEMORY: ": PRINT PT\$ CHART" 1850 PRINT: PRINT"DO YOU WANT TO 1630 PRINTTAB(T)"7 - END PROGRAM ADD TO IT?" 1640 PRINT@448,STRING\$(32,140):: 1860 I\$=INKEY\$: IF I\$=""THEN1860 PRINT TAB(9) "YOUR CHOICE?";:SOUN 1870 IF I\$="Y" THEN GOSUB1540:GO D100,1 1650 I\$=INKEY\$:IF I\$=""THEN1650 1880 N=0:GOTO150 1660 I=VAL(I\$): IF I<0 OR I>7 THE 1890 GOSUB1540 N SOUND100,1:GOT01650 1900 LINEINPUT"FILE NAME: ";F\$ 1670 ON I GOTO 1830,1890,2020,21 1910 IF F\$="?" THEN DIR: GOTO1900 1920 IF F\$="" THEN 1530 00,2280,2460 1680 GOSUB1540: PRINT" DO YOU WAN 1930 PRINT: PRINT" PROJECT BEING T TO PREPARE A WORK- SHEET AT T LOADED: " HIS TIME?" 1940 OPEN"I",#1,F\$ 1690 I = INKEY : IF I = "THEN 1690 1950 X=0 1700 IF I\$<>"Y"THEN CLS:END 1960 INPUT#1,PT\$,Y:N=N+Y 1970 PRINT" ":PT\$ 1710 PRINT: INPUT" RESPONSIBILITY ":K\$ 1980 IF EOF(1) THEN 2010 ELSE X=X 1720 GOSUB 2650 1730 U\$=" % 1990 INPUT#1, A\$(X), R\$(X), A(X,1), A(X,2),S(X),F(X),E(X,1),E(X,2),C% % ### "+STRING\$(8,95)+ " +STRING\$(8,95) 2000 GOTO 1980 1740 PRINT#-2,CHR\$(30);" PROJEC 2010 CLOSE#1:GOTO1530 2020 GOSUB1540 T: "PT\$:PRINT#-2." (WD 2030 LINEINPUT"FILE NAME: ";F\$ RKSHEET FOR RECORDING TIME ESTIM ATES) "; CHR\$(13); CHR\$(13); CHR\$(28 2040 OPEN"O",#1,F\$ 2050 WRITE#1, PT\$,N 1750 PRINT#-2," 2060 FOR X=1 TO N 2070 WRITE#1,A\$(X),R\$(X),A(X,1), RESPONS. BEG END TIME A(X,2),S(X),F(X),E(X,1),E(X,2),CTO" (X) 1760 PRINT#-2," -----2080 NEXT X 2090 CLOSE#1:GOTO1530 2100 GOSUB1540 2110 PRINT" DO YOU WANT TO CHAN 1770 FOR I = 1 TO NGE ANY OF THE DATA BEFORE EVA LUATING 1780 IF INSTR(R\$(I),K\$)=0THEN181 THIS PROJECT?" 2120 I = INKEY : IF I = "THEN2120 2130 IF I\$="N" THEN 940 1790 PRINT#-2,USING Us; As(I),Rs(2140 IF I\$<>"Y" THEN 2120 I),A(I,1),A(I,2),E(I,1)1800 IF INT(I/58)=I/58 THEN PRIN 2150 PRINT:LINEINPUT" KEYWORD: ":K\$ T#-2,CHR*(12) 1810 NEXT I:PRINT#-2,CHR\$(12) 2160 U\$="% ###":FOR X=1TON 1820 GOTO 1530 2170 IF INSTR(A\$(X),K\$)=0 THEN 2 1830 IF PT\$=""THEN 60 1840 GOSUB1540: PRINT"PROJECT CUR 2180 GOSUB1540

See You At

RAINBOWfest CHICAGO For Details

See Page 114

May 17-19

COMPUTER

ISLAND



MATH

THE MONEY SERIES BY STEVE BLYN

DOLLARS & SENSE 16K ECB \$14.95 Player buys familiar items using dollars and coins to practice using money correctly.

McCOCO's MENU 16K ECB \$14.95 Learn to buy and add up your pur-chases from a typical fast-food restaurant menu.

MONEY-PAK 32K ECB \$22.95 A combined and menu driven version of the above programs. Includes play money. Reviewed - Rainbow 7/83

EQUATIONS TUTORS 19.95 EA. by Ed Guy 32K FR

Elementary-intermediate algebra. Step by step tutorials. SPECIFY Linear or Quadratic.

GRAPH-IT \$14.95 16K EB.

Graph algebraic equations on a hires screen. Linear, quadratic, etc. By D. Steele

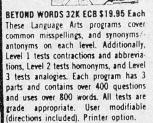
MATH INVADERS by David Steels \$17.95 16K EB.

A multi-level 'Space Invaders' type game to reinforce the 4 basic math operations (addition, subtraction, multiplication and division). Problems become more difficult as you progress. Hi-res. graphics, joystick required.

32K EB. Disk \$20.95

SCIENCE

SCIENCE GAME by J. Keeling 32K EB. Disk Only Over 600 questions in 9 categories. Makes learning science facts fun. Game format, 1 or 2 players, teams. Grade 8 and



Level 1 Grades 3-5 Level 2 Grades 6-8 Level 3 Grades 9-12

Each \$23.95 DISK VERSION

THE MATH TUTOR SERIES 16K Ext. These tutorials take the child through each step of the example. All programs include HELP tables, cursor and graphic aids. All allow user to create the example, or let the computer choose, Multi-level. Great teaching programs. By Ed Guy.

LONG DIVISION TUTOR \$14.95 MULTIPLICATION TUTOR \$19.95 **FACTORS TUTOR** FRACTIONS TUTOR (Addition) \$19.95 FRACTIONS TUTOR (Subtraction) FRACTIONS TUTOR (Multiplication) \$19.95 Any 2 FRACTIONS programs

32K TRIGONOMETRY TUTOR By Ed Guy \$24.95

A step by step tutorial for learning to compute the sides and angles of right triangles. All examples have graphic representation.



GRAPH TUTOR 32K ECB Line, bar, pie and pictographs are demonstrated. Learn to read and use these graphs. Test mode, Hi-res graphics throughout. By Chris Phillips.

CROCODILE MATH 16K Ext. \$17.95 By Art Provost

An animated math game using hires graphics. A fish containing a problem moves toward a crocodile containing a possible answer. If the answer is true, open the crocodile's mouth with the joystick to eat the fish. If faise, keep his mouth closed. Addition, subtraction, and multiplication examples on 3 levels, 3 speeds. Tape only.

Preschool

PRESCHOOL SERIES \$11.95 EA. recognition and counting 32K EB. tape \$21.95 disk \$24.95 Pre. 2 - 2 programs for simple ad dition, number game. Pre. 3 - Alphabet recognition.



All 16K E.B. By J. Kolar

FIRST GAMES 32K EB. tape \$24.95 disk \$27.95 Ages 4 and up. First Games contains 6 menudriven programs to delight and teach your early learners (ages 3-6). These games enrich the learning of colors, numbers, lowercase letters, shapes, memory, visual discrimination and coun-



STATES & CAPITALS \$19.95 Multiple choice quiz on a hi-res screen 32K E.B.

EXPLORERS & SETTLERS \$19.95 Hi-res screen. Multiple choice quiz on explorers and settlers of the new world.

Pre. 1 - 2 programs for number ARROW GAMES by Penny Bryan

Six menu driven games for young children (ages 3-6) to teach directions. All games involve using the arrow keys. Games include LADYBUG, BUTTERFLY, ARROW MATCH, KALEIDOSCOPE, RAB-BIT, and DOODLE. Colorful graphics.

MR. COCOHEAD 16K E.B. \$16.95 Create over 10,000 funny faces. Facial features controlled through' by Penny Bryan keyboard. Surprise command.

Social Studies



KNOW YOUR STATES \$19.95 32K Shows each state to identify on hires screen. Help command and scoring. By J. Keeling

THE HISTORY GAME 32K ECB \$14.95 "Jeopardy" type game by James Keeling. 5 categories and 5 questions in each category. One or two player game checks your knowledge of American History. Different questions each round. Hi-res graphics.

Language Arts

(ALL PROGRAMS IN 16-K EXTENDED EXCEPT WHERE NOTED)

CONTEXT CLUES - by Steve Blyn - Multiple choice reading each \$17.95 programs. Specify grade 4,5,6 or 7.

VOCABULARY BUILDERS - 32K - Great for test preparations. 200 questions, multiple choice, modifiable, printer option. each \$19.95 I (grades 3-5), II (6-8) or III (9-12)

\$19.95 READING AIDS 4-PAK - Child creates own reading material.

FOREIGN LANGUAGE

each \$11.95 FRENCH OR SPANISH BASEBALL - By S. Blyn Vocabulary practice. 200 words. Modifiable. Specify language. \$19.95 Also in 32K (500 words) \$15.95 HEBREW BULLETIN BOARD-by J. Kolar-utility to print words.

NEBREW ALPHABET - Learn the letters of this alphabet. \$11.95 COCO WHEEL OF FORTUNE TAPE ONLY 32K EB \$19.95 Hi-res graphics and screen in this version of the popular TV show. One or two players. Spin the wheel for points and guess a letter to solve the puzzle. Over 225 puzzles. Have fun while strengthening language arts

KING AUTHOR'S TALES \$29.95 Student may create and save original stories on files. Question/Answer, title page picture features, too. Rewirte, review, and printer features. Includes selection of stories and pictures. 32K EB Disk or 16K EB Tape

Educational

Software

TEACHER/STUDENT AIDS

THE QUIZ MAKER by David Stanley 32K EB. tape \$24.95 disk \$27.95 A program that enables a teacher to create tests or a student to study for tests in any subject area. Your questions and answers may be saved for future use. Short answer, true-false, fill-in and other quiz formats are supported. Printer option for hard copy test generation. Program randomizes questions, keeps track of score and provides a variety of testing

ARITHMETIC TUTOR DIAGOSTIC FRACTIONS TUTOR DIAGNOSTIC \$49.95 each

More of the MATH TUTOR SERIES. diagnostic feature permits teachers to keep records of students' progress on the disk using a password. Printer option generates hard copy of progress reports. ARITHMÉTIC TUTOR covers multiplication, division, factoring, and order of operations. FRACTIONS TUTOR covers addition subtraction, multiplication, and division of fractions. Easy to operate. Disk only. By Ed Guy.

COLORGRADE 32K ECB \$29.95 A great aid to teachers. Records and calculates grades for up to 6 classes of up to 40 students each. Uses number or letter grades, named or numerical periods and gives a weighted average. Easy to use. Full directions. DISK ONLY. By David Lengyel.

COMPUTER LITERACY by Steve Blyn

32K E.B. \$19.95 A computer literacy quiz exclusively for the Color Computer. Tests and scores from over 60 questions on a HI-RES upper and lower case screen. Reviews computer literacy and beginning programming knowledge. Ages 10

DISK ONLY One of the most innovative and thought-provoking programs we've ever seen. A role-playing simulation whereby students are given the opportunity to experience the challenges and frustrations of inner city dwellers in America. 10 roles, each with individual profile. Students decide how their "character" uses the opportunities given to improve or impair that character's life. Meant for use in junior and senior high school history or social science classes, but also an interesting family activity at home. Teacher



I LOVE MY COCO TEE SHIRT \$6.95 each + \$1.00 S/H per shirt Available in Adult Sizes S. M. L. XL. and Youth L (14-16) White with Red Trim and Blue Logo TREAT YOURSELF OR A FRIEND TO A GREAT GIFT. CALL US FOR DETAILS ON SCHOOL/CLUB ORDERS.

VERBAL MATH PROBLEMS

PIZZA GAME 32K EB. \$19.95 Learn to locate coordinates on a grid. HI-RES text and graphics.

AREA & PERIMETER 32K EB.

\$19.95

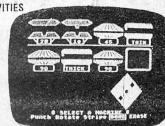
Triangles, rectangles, and circles are covered in this HI-RES text and graphics program.

SALES & BARGAINS 32K EB.

\$19.95

Learn to find the discounted price. HI-RES text and beautiful graphics

ACTIVITIES



The Factory: FROM SUMBURST Strategies in Problem Solving

Grades 4-adult. Winner 1983 Learning Software Award. Recommended in Classroom Computer Learning, Courseware Report Card and Electronic Learning Unique three-level program challenges students to create geometric "products" on a simulated machine assembly line which the student designs.

Diskette for 32K TRS-80 Color Computer with Extended Color BASIC. \$39.95

The Pond: FROM SUMBURST Strategies in Problem Solving

Grades 2-adult. Winner 1983 Learning Software Award. Recommended in Classroom Computer Learing. A small green frog, lost in a pond of lily pads, helps students recognize and articulate patterns, generalize from raw data and think logically. Diskette for 32K TRS-80 Color Computer with Extended Color BASIC \$39.95

STRANDED \$24.95 DISK ONLY

A fully graphic adventure in which you are an astronaut stranded on the moon. Your space ship cannot be repaired and you must get back to earth. Inventory displayed on screen at all times. Save and re-load at any time. Map included, if you wish to use it. An entertaining way to improve critical thinking.

DISTANCE PROBLEMS \$19.95

Moving graphics and text combines on a hi-res screen. Rate x Time = Distance in all its forms. 32K E.B.



Dealers inquiries invited.



All payment in U.S. funds.



(718) 948-2748 Dept. R 227 Hampton Green, Staten Island, N.Y. 10312



Send for catalog with complete descriptions.

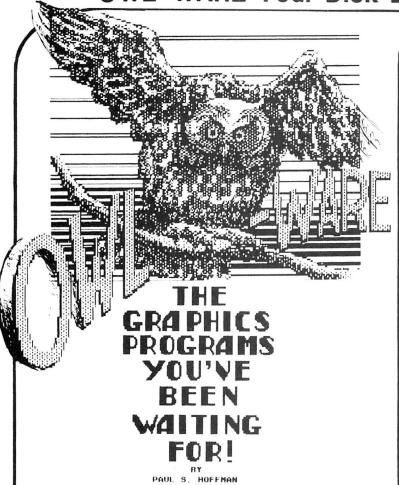
Please add \$1.00 per order for postage. N.Y. residents, please add proper tax. FREE set of BINARY DICE, including full directions, with orders of 2 or more items

Authors: We are seeking quality children's software for leisure or learning. Write for details. Top Royalties. TRS-80 Color Computer. TDPSystem 100.

```
2190 PRINT A$(X):PRINT
2200 PRINT USING Us; " START NODE
",A(X,1):PRINT USING U$;" END NO
DE", A(X,2)
2210 PRINT USING U$;" EXPECTED D
URATION"; E(X,1): PRINT USING U$;"
 VARIANCE": E(X.2)
2220 PRINT: PRINT" CORRECT RECORD
?":PRINT @480."
                    (PRESS <ENTE
R> TO END)":
2230 I$=INKEY$:IF I$=""THEN2230
2240 IF I = "Y" THEN I = X: FLAG=1: G
2250 IF I$=CHR$(13) OR X=N THEN
GOSUB 1540: PRINT: PRINT" CLEARING
REGISTERS.....":FOR X=1TON:F(X
)=0:S(X)=0:NEXTX:PRINT:PRINT" RE
COMPUTING START/END TIMES...": GO
T0810
2260 NEXT X
2270 FLAG=0:GOTO1530
2280 GOSUB1540: PRINT: INPUT "RESPO
NSIBILITY":K$
2290 TIME=0
2300 GOSUB2650
2310 V=0:C=0:L=0
2320 PRINT#-2,CHR$(30);"
                            PROJE
CT: "PT$:PRINT#-2
2330 PRINT#-2,CHR$(29);"
          ----NODES----
                            EXP.
    -START TIME-
                  --END TIME-
      SLACK"
2340 PRINT#-2."
   STEPS
                         RESP.
                  TIME
 START
           END
                            EARLY
    LATE
           EARLY LATE
                            TIM
E "
2350 PRINT#-2,"
____11
236Ø U$="
              %
                              ###
            ###.#
                      ###.#
      ###.#
             ###.#
                        ###.#
          %
2370 FOR I=1 TO N
2380 IF INSTR(R$(I),K$)=0 THEN 2
2390 \text{ S1=F(A(I,2))-S(A(I,1))-E(I,}
1): IF INT(S1)=<0 THEN C(I)=0 ELS
EC(I)=S1
2400 IF C(I)=0 THEN CR$=CHR$(93)
+"-- PAINTRITICAL" ELSE CR$=""
2410 PRINT#-2, USING U$; A$(I), R$
(I),A(I,1),A(I,2),E(I,1),S(A(I,1),I)
)),F(A(I,2))-E(I,1),S(A(I,1))+E(
```

```
I,1),F(A(I,2)),ABS(S1),CR$
2420 TIME=TIME+E(I.1)
2430 NEXT I
2440 PRINT#-2:PRINT#-2:PRINT#-2.
     TOTAL EXPECTED TIME: ":TIME
:PRINT#-2:PRINT#-2
2450 GOTO 1530
2460 GOSUB1540:PRINT:INPUT"RESPO
NSIBILITY":K$
2470 GOSUB2650:PRINT#-2,CHR$(30)
:CHR$(31)::PRINT#-2,TAB((40-LEN(
PT$))/2)PT$
2480 PRINT#-2, CHR$(30); TAB(25)"(
CRITICAL PATH SCHEDULE)"
2490 PRINT#-2:PRINT#-2,"RESPONSI
BILITY: ";: IF K$="" THEN PRINT#-
2, "ALL" ELSE PRINT#-2,K$
2500 PRINT#-2,CHR$(29);TAB(35)"
                           30
        10
                  20
                50
                         60
    70
              80
                       90
  100"
2510 TT$="+----+-
TT$
2520 FOR I=1TON
2530 IF INSTR(R$(I),K$)=0 THEN 2
2540 IF LEFT$(A$(I),1)="*" THEN2
630
2550 PRINT#-2,USING"%
                    %":A$(I)::P
RINT#-2, TAB (35) "!"; : PRINT#-2, TA
B(S(A(I,1))+36);
2560 T1=INT(S(A(I,1))+.5):IF C(I
)=0 THEN T=INT(F(A(I,2))-.5):M$=
"C" ELSE T=INT(S(A(I,1))+E(I,1)-
.5):M$="X"
2570 FOR X= T1 TO T
2580 PRINT#-2.Ms:
2590 NEXT X
2600 IF C(I)=0 THEN PRINT#-2:GOT
02630
2610 FOR X=S(A(I,1))+E(I,1)+1 TO
 F(A(I,2))
2620 PRINT#-2,".";:NEXTX:PRINT#-
2630 NEXT I:PRINT#-2,TAB(35);TT$
2640 GOTO 1530
2650 IF PEEK(65314)=4 OR PEEK(65
314)=6 THEN PRINT@480."
                          DATA
BEING PRINTED NOW
                   "; : RETURN
2660 PRINT@480."
                    PRINTER IS
 NOT READY";:SOUND100,5:FORX=1TO
500: NEXT: GOTO1530
2670 RETURN
2680 PMODEO,1:PCLEAR1:GOTO20
```

OWL-WARE Your Disk Drive Specialists





CREATE BEAUTIFUL PICTURES WITH

Convenient, on-screen menu accepts input from X-PAD, TOUCH-PAD, MDUSE or JUYSTICK magnification mode Draw with custom paintbrushes gasy free-hand sketching "Paint" Command 10 colors at a time Pictures are ready for use in BRSIC programs
Lettering in any size or other Tandy printers
SCREEN dump to Color Ink-Jet or other Tandy printers

COMBINE PICTURES, MANIPULATE THEM, AND BUILD ANIMATIONS WITH

ANIMATOR'S TOOLBOX

H Shrink pictures in 502 steps and position them anywhere all in REAL TIME!
H Make pictures tumble "head-over-heels"
Shift a picture around on the screen
H Replace i color in a picture with a "background" picture with a "background" picture in a build complicated animations not limited to a few frames

AND DON'T FORGET THE ULTIMATE TREK ADVENTURE -- STELLAR SEARCH

AUAILABLE IN **TALKING** (FOR "REAL TALKER" FROM COLORWARE) OR NON-TALKING VERSIONS

CALL TOLL-FREE FOR ORDERS: 1-800-245-6228 IN PA. OR FOR TECH-NICAL QUESTIONS: - 215 - 682 - 6855

BUY 2 PROGRAMS, GET 10 PERCENT DISCOUNT!

BUY ALL THREE, GET 15 PERCENT OFF!!

DRIVE 0 or 2 DRIVES

\$255. WITH RS DOS OR JDOS 40 TRACK DRIVE

40 TRACK DRIVES NOW ARE NEW 1/2 HEIGHT DIRECT DRIVES

DISK DRIVI

\$155.INCLUDING CASE & POWER SUPPLY Double Sided \$185.

PANASONIC 1/2 HEIGHTS (ADD \$10. FOR TEAC DS) \$205. with Owl Doubler 2 DRIVE \$320.-\$340. with Owl Doubler

NOW DOUBLE YOUR OWLS!!! \$39.95

OWL DOUBLER is a device that allows use of both sides of double sided drive! Software independent sits inside case and makes one disk drive 0&1 and the other 2&3!

> 40 track single sided drives may be manufacturers overstock.

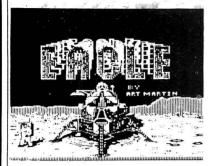
6 month warranty on all drives.



M.C. & VISA Accepted OWL-WARE PO Box 116-6 Mertztown PA

> TOLL FREE: (800) 245-6228 (215) 682-6855

New From Saguaro Software!



EAGLE

A graphic-enhanced lunar lander simulator. The pilot breaks out of lunar orbit and attempts a soft landing on the lunar surface. Joysticks control thrust and craft altitude and information is continually displayed on horizontal and vertical velocities, acceleration values, vertical and horizontal distances from target, fuel consumption and much more. On advanced levels, problems such as fuel leaks and computer screen failures can provide hatiraising final approaches. Disk version allows choice of landing site between Mars and Earth's moon. Takeoffs from the surface can be made and the upper stage placed back in orbit. The simulation is as educational as it is fun and exciting. A great tool for that future astronaut or physicist. 32K., 2 joysticks required. Available in tape or an entranced disk version.

Tape - \$24.95 Dis

Disk or Amdek - \$29.95

SKETCHPAD

Sketchpad is a graphics drawing program designed to provide the computer hobbyist with easy manipulation of the powerful graphics capabilities of the Coco. Advanced programmers can design graphics screens and characters for Basic and ML programs and games. Sketchpad was used to create the graphics for "Eagle"

Two joysticks control cursors that provide endpoints and boundaries for lines, boxes, circles, ellipses and painting. Point-to-point drawstrings may be plotted on the screen and then rotated, enlarged or shrunk, moved or inverted Patterns may be programmed in easily to create dazzling illusions using lines, boxes, circles, ellipses and drawstrings. Sketchpad supports all PMODES and color sets and gives false colors in Pmodes 1 and 4 Text and graphics can be combined on high-resolution screens. All pictures and drawstrings can be saved to disk for future use. 32K, 2 joysticks required. Disk only. \$29.95

TDIR

Tape Directory

TDIR is a menu-driven, user-friendly tape directory program. When installed and maintained on your cassette tapes, it allows complete directory control of your tapes. This means you will no longer need to go through a complete tape to discover that the program you wanted is on another tape.

TDIR also eliminates the drudgery of trying to remember tape position settings, or program names. All this, and more, is controlled by TDIR 16K tape. \$24.95

MAYCODE

Disassembler For The TRS-80" Color Computer

A 6809 disassembler It will read Object Codes from memory and convert them to standard 6809 assembly language mnemonics, which can be disassembled to the screen, printer, cassette, or disk. When output is to tape or disk, the source code can then be loaded into EDTASM for modification, even changing the origin address 16K min. 32K recommended Tape, \$24.95 Disk or Amdek, \$29.95

MODE CACHADOL

The Digestive System

An educational quiz game for 2 players covering different areas of the human digestive system. Each question is assigned a point value relative to its difficulty. A fun way to learn about a serious subject. 16K

The

Circulatory System

Using the same format as "The Digestive System," this program covers the heart, lungs, veins, arteries, blood, etc. 16K.

BOTH ONLY:

Tape - \$19.95 Disk or Amdek - \$24.95

TESTMAKER

The TESTMAKER series is a menu-driven, userfriendly system of programs. These programs are internally linked, meaning that once you have begun, the program will automatically control the operation of the system.

TESTMAKER will allow the user to create both multiple choice and true-false tests. These tests may be run on the screen for an immediate test of the student or they may be printed and passed out to the class for a more standard exam.

TESTMAKER also has the feature of allowing an unlimited number of files with an unlimited file length This means that the educator may create tests weeks, months, or years ahead and keep them on file until needed. This also means that each test may have as many questions as the educator wishes 32K disk. \$29.95

ALPHACOPY

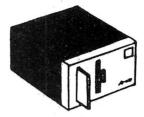
The Disk Organizer

An alphabetized disk directory is great, but if that should crash if doesn't help tell you where the programs are ALPHACOPY will write the programs in alphabetical order. Each program will be written on the same or consecutive sectors, making rebuilding of the disk much easier than the other currently available "zapping" utilities. 32K disk Disk or Amdek, 524,95

OTHER FAVORITES!

MORE SAGUARO!		OTHER PAVORITES!				
OXHTC	24.95	Worlds Of Flight 32K	23.75			
Co-Co Keno	24.95	Sailor Man 64K	23.75			
Ultimate Bingo/Jackpot	19.95	SR-71 32K	22.75			
Confusion	19.95	To Preserve Quandic - Disk 32K	29.75			
Kidstuff 32k	19.95	Gravitor	18.75			
Stars of Amer./Civil War	19.95	Compleat Enchanter 32K	18.75			
History - 1863 to 1976	19.95	Lizpack Stat Anal - 8 Disks	145.00			
Treasure Hunt - Disk Only 64K	29.95	Telepatch 64k - Disk Only	14.75			
Raid On Burdanovka 32k	24.95	Demon+ 64K	26.75			
Search For The Llangth	24.95	Rainbow Screen Machine	22.75			
Do Or Die	24.95	Super Screen Machine	33.75			
Add \$5.00 For Disk or Amdek		Add \$3.00 For Disk \$6.00 For Amd	ok.			

Hardware, Too!

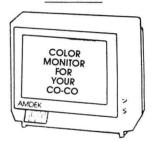


Amdek Dual 3" Disk Drive

\$349

Includes Box Of Diskettes And Drive Cable

If You Can Find A Better Advertised Price, Show Us... We'll Beat It!



Amdek Color Monitors
Color 300 ● Color 500

Call For Lowest Prices Anywhere!

ESK 5 1/4 Disks - SSDD Box Of 10 \$16
ESK 5 1/4 Disks - DSDD Box Of 10 \$21
100% Tested Disk • 10 Year Exchange Warranty
Amdek 3" Diskettes Box Of 10 \$35

-This Month's Special! FILMASTR

A powerful Data Management System for the Coco. FILMASTR combines the best features of the big systems to provide a combination of speed, power & simplicity that can't be beat.

Tape - \$19.75 Disk - \$22.75
Reg. 23.75 Reg. 26.75
Good Through 3/30/85 • While Supply Lasts

We Have Gift Certificates!

In Any Amount
Write For Our Catalog

Saguaro Software



24 HOUR ORDER LINE 602-623-3321

602-623-3321 1828 E. Ninth, Tuscon, AZ 85719 VISA®

Arizona Residents Add 7% Tax • Add \$1.50 Shipping Per Program (\$4.50 Max.)

Dealer Inquiries Invited • Some Quantities Limited

AUTHORS! ASK ABOUT OUR ROYALTY PROGRAM



You Can Invest In This One **T-bill Computation**

By Walter J. Tucker

n Monday of each week, the U.S. Treasury borrows billions of dollars by auctioning 13-week and 26-week T-bills (treasury bills). The 52-week T-bills are auctioned on the fourth Thursday of each month. Many of the T-bills are purchased by the public at the "average" price, which is available after the auction. The discount rate is published on the following day in the financial pages of many news-

(Walter Tucker, a retired engineer from the "Voice of America" and an avid radio amateur with the call KAIGQ, has written numerous other financial programs.)

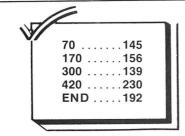
papers. Some of these also include the price. (The results of the most recent auction can be obtained from a telephone tape, 202-287-4100.)

T-bill Computation provides the investment rate which equates the coupon rate of other investments, as well as the number of days to maturity, profit, and the amount of your federal income tax on the T-bill. The interest on U.S. Treasury bills is not subject to state income tax.

If your state has an income tax, the amount of this savings is also shown. The profit on a 52-week T-bill differs from the investment rate, which is comparable to the coupon rate on an investment which pays interest semiannually.

The program requires the discount rate. It also requires either the cost of the T-bill or the exact number of days to maturity. If neither of these are available, use 91, 182, and 364 days to maturity, respectively, for 13-, 26- and 52-week bills, as these figures are likely to be accurate since they change only when the day of issue or maturity would fall on a holiday.

For information or applications to purchase U.S. Treasury bills call 202-287-4114, or write to the Bureau of the Public Debt, Washington, D.C. 20239-0001.



The listing:

10 CLS0:GOSUB320:PRINT"THIS PROG RAM PROVIDES THE COUPONOR INVEST MENT RATE, PROFIT, DAYSTO MATURI TY, AS WELL AS FEDERAL & STATE T

AX IMPLICATION OF EACH T-BILL.": PRINT: PRINT: PRINT"DO YOU NEED IN <Y/N>": PRINT "PRESS STRUCTIONS? <S> TO RECORD":PRINT:PRINT:: 20 GOSUB520: IFW\$="N"THEN100 30 IFW\$="S"THEN450 40 CLS: PRINT"EACH WEEK THE U.S. BORROWS BILLIONS OF TREASURY AUCTIONING 13 & 26 DOLLARS BY WEEK T-BILLS, USUALLY ON MONDAYS, AND 52-WEEK T-BILLS EACH MONTH. PURCHASED AT AVERAG MANY ARE

E COST.";
50 PRINT"RATES ARE PUBLISHED IN
FINANCIAL PAGESOF MANY TUESDAY N
EWSPAPERS, SOME INCLUDE COST.";
60 PRINT" RECENT AUCTION RESU
LTS ARE ON TELEPHONE TAPE (202
)-287-4100. FOR INFORMATION CALL
(202)-287-4113 OR WRITE TO: THE
BUREAU OF THE PUBLIC DEBT, WA
SHINGTON, D.C. 20239-0001":GOSUB
530:GOSUB520

70 CLS0:GOSUB320:PRINT"THIS PROG RAM REQUIRES DISCOUNT RATES. I F NEITHER THE COST NOR THE EXACT DAYS TO MATURITY ARE KNOWN, TH EN USE 91, 182, & 364 DAYS RESP ECTIVELY FOR 13 & 26 WEEK AND 1-YEAR T-BILLS AS THESEARE MOST LIKELY TO BE ACCURATE."

80 PRINT:PRINT:PRINT:GOSUB530:GO SUB520

100 CLS:GOSUB510:GOSUB470:PRINT@ 324,"(C)1984 WALTER J. TUCKER";: PRINT@356," 8211 CARRLEIGH PARKW AY ";:PRINT@388," SPRINGFIELD, VA. 22152 ";:GOSUB480

110 CLS:GOSUB320:INPUT"DISCOUNT RATE IN %";A:PRINT:IFA<70RA>15TH EN110 120 INPUT"COST OR NUMBER OF DAYS
TO MATURITY"; G: IFG<367THE

ND=G

130 IFG>366THENB=G

140 IFG<367THENB=INT(10000*(1-((A/100)*(D/360)))*10+.5)/10

150 C=10000-B:IFG>366THEND=INT(C *3.60/A+.5)

160 CLS:GOSUB320:PRINT"DISCOUNT RATE=";A;"%":PRINT:PRINT"COST=\$" ;INT(B*100+.5)/100:PRINT:PRINT"A MOUNT OF INTEREST=\$";INT(C*100+. 5)/100:PRINT:Y=365:IFD>=363ANDD< =365THEN200

170 IFD>=181ANDD<=183THEN210

180 IFD>=90ANDD<=92THEN220

190 GOTO330

200 PRINT"1 YEAR -";D;"DAYS TO M ATURITY":GOTO230

210 PRINT"6 MONTHS -";D;"DAYS TO MATURITY":GOTO240

220 PRINT"3 MONTHS -";D;"DAYS TO MATURITY":GOTO240

230 E=INT(1000000*(SQR(((D/Y)^2)-(4*(D/(2*Y)-.25)*(((B/100)-100)/(B/100))))-(D/Y))/(2*(D/(2*Y)-.25))+.65)/1000:GOTO250

240 E=1000000*(C*365)/(B*D)/1000 250 PRINT:PRINT"INVESTMENT RATE=

WALLABLE DRAGON
NOW USER

To make the most of your new Dragon microcomputer from Dragon-Tano, you need *Dragon User*— the international, independent magazine for Dragon owners.

Signed.

Each issue of *Dragon User* contains:

- reviews of the latest software
- programming advice for beginners
- hardware projects

The Dragon microcomputer was launched in the UK last year. Since then we have developed a knowledge and mastery of the machine's abilities. You can benefit from our experience by subscribing to *Dragon User*, which is expanding its coverage to include all US developments.

To make sure that you receive a copy of *Dragon User* regularly, subscribe direct to us. This costs only \$29.95 for 12 issues airspeeded to you — or take advantage of our special offer to long-term subscribers. Individual copies of the magazine can be obtained from your Dragon dealer.

- program listings covering games and utilities
- reviews of Dragon peripherals and add-ons
- technical advisory service
- programming articles for users

Subscription order form. Receive a free book and save money by take	ing out a
long-term subscription - a two-year subscription saves 10%, a three-	
subscription saves 20%. In addition, long-term subscribers will receive	
copy of either 🗌 The Working Dragon or 🗆 Dragon Games Master. PI	ease send
a check, made payable to <i>Dragon User</i> , with this form.	

Start my subscription from the following issue

Name

Address

Subscription rates US and Canada airspeeded US\$29.95 for 12 issues/1 year US\$53.90 for 24 issues US\$71.90 for 36 issues Send this form to Dragon User, % Business Press International, 205 E. 42nd St., New York, NY 10017.

..... Date.....

":INT(1000*E+.5)/1000:"%":GOSUB3 40: GOSUB520: IFW\$="R"THEN110 260 IFQ=1THEN290 270 CLS:PRINT:PRINT:PRINT:PRINT" DOES YOUR STATE HAVE AN INCOME <Y/N>":GOSUB520:PRINT:PRIN TAX T:Q=1:IFW\$<>"N"ANDW\$<>"Y"THENQ=0 : GOTO270 280 IFW\$="Y"THENL=1 290 IFL=1THENCLS:PRINT:PRINT:PRI NT: INFUT"WHAT IS YOUR STATE INCO ME TAX BRACKET(%)";ST:IFST<10R ST>20THEN290 300 CLS:PRINT:PRINT:PRINT:INPUT" WHAT IS YOUR FEDERAL INCOME TAX BRACKET(%)";H:IFH<10RH>50THEN300 310 CLS:PRINT:H=H*.01:J=C*(ST/10 0):Z=(C-(H*(C-J)+J))/B:Y=(C-H*C) /B:GOTO360 320 PRINT" U.S. T-BILL COMPUTA TION": PRINT: RETURN 330 CLS4: PRINT@164, "INFORMATION IS INCORRECT";:PRINT@261, "RECHEC K YOUR SOURCE OF"::PRINT@330,"IN FORMATION":::FORV=1T06000:NEXT:C LS: GOTO110 340 PRINT@416," <ENTER> TO CONTIN UE": PRINT@448, "<R> TO RECOMPUTE T-BILL": RETURN 350 PRINT@384,"<C> TO CHANGE TAX BRACKETS": RETURN 360 CLS:PRINT"COST=\$":INT(B*100+ .5)/100:PRINT"AMOUNT OF INTEREST =\$":INT(C*100+.5)/100:PRINT:PRIN T"IN A": H*100: "% TAX BRACKET YOU R". "FEDERAL TAX ON THIS T-BILL I S","\$";INT(H*C*100+.5)/100:PRINT : IFST>ØTHENPRINT"IF TAXED BY YOU R STATE AT"; ST; "%"; 370 IFST>0THENPRINT"STATE TAX WO ULD BE \$": INT(J*100+.5)/100 380 IFST>0THENPRINT"FEDERAL TAX WOULD BE \$": INT(100*H*(C-J)+.5)/ 100, "THEN, TOTAL TAX WOULD BE \$"; INT((H*(C-J)+J)*100+..5)/100390 GOSUB350:GOSUB340:GOSUB520:I FW\$="C"THEN290 400 IFW=="R"THEN110 410 K=H*(C-J)+J:CLS:PRINT@64,"PR OFIT IF ONLY FEDERALLY TAXED=",I NT((((((365/D)*(C-H*C)))/B)*10000 +.5)/100: "%": PRINT: IFST>0THENPRI NT"PROFIT IF ALSO STATE TAXED=", INT(((365/D)*((C-K)/B))*10000+.5)/100;"%":PRINT 420 IFST>0THENPRINT"DIFFERENCE=" :INT((365/D)*(((C-H*C)/B)-((C-K)/B)))*10000)/100;"%" 430 PRINT@416," (ENTER) TO RECHEC

K <^> TO RESTART PR OGRAM": GOSUB520: IFW#="^"THEN10 44Ø GOTO36Ø 450 CLS2:PRINT:PRINT:PRINT:PRINT @192, "START RECORDER, THEN PRESS ENTER": MOTOROFF: INPUTW\$: MOTORON :CLS3:FORW=1TO60000:NEXT:PRINT@19 6. "NOW RECORDING 'T-BILLS'"::PRI NT@228," (U.S. TREASURY BILLS) " :: CSAVE"T-BILLS": CLS: MOTORON: FOR W=1T01000:NEXT 460 MOTOROFF: GOTO10 470 CLS5: C=63:F=31:PRINT@132." COMPUTATION FOR "::PRINT@1 64," U. S. TREASURY BILLS RINT@196," ISSUED BY THE BUREAU OF THE PUBLIC "::PRINT@228," "::PRINT@260," WASHINGTO N. D.C. 20239 "::PRINT@292,"#### 480 Z=4:FORK=0TO2:FORA=B TOC:SET (A.D.Z): NEXT: FORH=E TOF: SET(C.H. Z):NEXT:FORG=C TOJ STEP-1:SET(G, F, Z): NEXT: FORI=F TOB STEP-1: SET ($J_IZ): NEXT: Z=1$ 490 B=4:C=59:D=4:E=4:F=28:J=4:IF K=1THENNEXTK 500 Z=3:B=6:C=57:D=6:E=6:F=26:J= 6: NEXTK: FORX=1T03000: NEXT 510 A=0:B=0:C=0:D=0:E=0:F=0:G=0: H=0: I=0: J=0: K=0: RETURN: FORW=1T09 999: NEXT: RETURN 520 W#=INKEY#:IFW#=""THEN520:RET 530 PRINT"########PRESS ANY KEY ######## : RETURN 1

Submitting Material To RAINBOW

Contributions to THE RAINBOW are welcome from everyone. We like to run a variety of programs which will be useful/helpful/fun for other CoCo owners.

Program submissions must be on tape or disk and it is best to make several saves, at least one of them in ASCII format. We're sorry, but we do not have time to key in programs. All programs should be supported by some editorial commentary explaining how the program works. Generally, we're much more interested in how your submission works and runs than how you developed it. Programs should be learning experiences.

We do pay for submissions, based on a number of criteria. Those wishing remuneration should so state when making submissions.

For the benefit of those who wish more detailed information on making submissions, please send a SASE to: Submissions Editor, THE RAINBOW, P.O. Box 385, Prospect, KY 40059. We will send you some more comprehensive guidelines.

Please do not submit programs or articles currently submitted to another publication.

PERIPHERAL INTERFACE ADAPTOR TUTORIAL PACK !!!

EVERYTHING YOU EVER WANTED TO LEARN ABOUT INTERFACING PERIPHERALS - TO YOUR COLOR COMPUTER!!!

OUR DUAL P.I.A. CARD FEATURES:

8 79.95

- INTERFACE ALMOST ANYTHING, i.e. PRINTERS, MODEMS, ROBOTS, MODELS, RAILROADS, MOTORS, JOYSTICKS, MILLING MACHINES
- COMES WITH A COMPLETE TUTORIAL ON THE OPERATION OF A P.I.A. (LIKE LOTS OF GOOD STUFF!).
- EACH P.I.A. CAN BE ADDRESSED INTO 4 DIFFERENT LOCATIONS
- COMES WITH EXAMPLES AND PROJECTS !!!
- WRITTEN FOR THE LAYMAN (YOU WON'T BE ONE FOR LONG!)
- FITS INTO THE CARTRIDGE SLOT OR MULTI-PAK, USING GOLD PLATED EDGES.

This is the main unit of the tutorial pack consisting of 2 PIA's that can be set with jumpers to any of 4 locations. Of the 40 available I/O lines, 10 lines go to 4 gold edge card connectors. Two of these 10 can be used as control lines, to generate a pulse to strobe the information, or handshake with the microprocessor. The documentation is probably the best feature of this system having been designed for educating novices to use quickly and understand completely.

OUR INPUT/OUTPUT DIGITAL SIMULATORS FEATURES:

- EXCELLENT AID TO DEBUGGING, STUDYING AND LEARNING THE OPERATION OF A P.I.A.
- A MUST FOR THE HARDWARE DESIGNER AND DEBUGGER
- INCLUDES VISUAL OBSERVATION OF DIGITAL OPERATIONS USING EITHER L.E.D.'S OR A 7 SEGMENT DISPLAY.
- INCLUDES INSTRUCTIONS ON HOW TO TEST I/O. I/O ON REQUEST, OR I/O WITH HANDSHAKE.
 LOGICAL STATES CAN BE SET BY ELECTRONICS, RS TYPE SWITCHES AND/OR STYLUS.(OPTIONAL SWITCHES CAN BE ADDED).
- ADJUSTABLE REGATIVE OF POSITIVE PULSE GENERATION ON CONTROL LINES OR USE THEM AS I/O. STATUS ON LED.

This is the companion unit to the Dual PIA cord. Any and all of the signals generated by the PIA can be monitored, tested, and manipulated. This complete kit was designed to be used in a classroom of industrial environment for those not yet familiar with computers. The objective was to give the users a simple test.

6 69.95

our <u>68000 CPU</u>

THIS CARD IS COMPLETE! JUST PLUG IT IN, AND BOY, DOES IT WORK!

- 8.16.32 BIT PROCESSING
- 2K STATIC VARIABLE STORAGE
- CENTRONICS PARALLEL PORT
- DIRECT MEMORY ACCESS TO AND FROM COLOR COMPUTER
- 4K MODITOR EPROM
- 64/124K INTERNAL RAM

FOR THE COLOR COMPUTER

- SPARE PARALLEL PORT
- CO-PROCESSOR MODE
- HOST/TERMINAL MODE

This SUPERFAST 8mghz. 68008 card has been designed around and for the Color Computer. These two beautiful micro-processors work in harmony with each other due to the similarity in architecture. As these are members of the same family, this system works better for the Color Computer then any other system. The two microprocessors can share resources either independently, via direct memory access, handshaking or co-processing. This means that this board can access the Color Computer dynamic ram, 6809, 6883, video display, or disk drives. It also adds it's own resources of a centronics port, parallel port, 2K static memory, and upto 256K RAM. (hows that for a 256K upgrade?)

This is only a development system. However, we anticipate the future will bring us a 7220 graphics controller and a Unix type operating system.

INTRODUCING.....

OUR SUPER CARD

8/128K ROM CARD - ADDRESSES ANY SIZE ROM!!!

- DESIGNED FOR MULTIPLE OPERATING SYSTEMS SUCH AS 0S-9, FLEX, RS-BASIC, KDOS. ..
- DYNAMICALLY SWITCHES BETWEEN OPERATING SYSTEMS.
- ROM ALL YOUR MOST FREQUENTLY USED ROUTINES OR APPLICATION SOFTWARE AND CALL WITH YOUR CUSTOM BASIC COMMAND.

6 99.95

- FULLY SWITCHABLE USING BASIC COMMANDS OR POKES.
- WITH KDOS 4.0 PROVIDES UP TO 128K VIRTUAL ROM IN CONJUNCTION WITH ANY RAM THAT IS ON LINE.
- DESIGNED FOR ANY SIZE CUSTOM ROM APPLICATIONS.

This super sweetheart of a card comes with super operating systems in mind. The instant boot and reboot of Os-9 or Flex, and the capabilities of using multiple operating systems in different banks make this card really attractive. When used in conjunction with our 128K ROM and/or our 68008 board, this board becomes almost indispensable. Designed by Tony Distefano, the quality and flexibility of this board reflect the true mark of useful friendliness.

rgs nicro electronics

USA

RGS MICRO INC. MAIN ST. DERBY LINE, VERMONT

ZIP 05830 TEL: 802-873-3386

ORDER LINE:

B00-B24-4454

TERMS: UISR, MC, SHIPPING: RATES?

COMBDA

RGS MICRO INC.
759 VICTORIA SQUARE, *303
MONTREAL H2Y 2J3
TEL: (514) 287-1563
ORDER LINE ONLY, FOR
QUEBEC, ONTARIO, MARITIMES

800-361-5338

WESTERN CANADA: 800-361-5155

BUSTOOLID DISTRIBUTOR BLAXLAND COMPUTER

76A MURPHY STREET BLAXLAND 2774 PO BOX 125 BLAXLAND NEW SOUTH WALES BUSTBALLA

TEL: (0477) 20-2000

HOURS: MONDRY-FRIDRY 10-6 SRTURDRY 10-4

Give us your best: Join the ranks of these courageous CoCoists in showing the Color Computer world your high score at your favorite micro-diversion. We want to put your best effort on record in THE RAINBOW's Scoreboard column. All entries must be received 60 days prior to publication. Entries should be printed - legibly - and must include your full name, address, game title, company name and, of course, your high score. Each individual is limited to three score entries per month. Send your entries to Scoreboard, C/O THE RAINBOW.

ADDITION Profession Control		c/o THE RAINBOW.	★ Current Record Holder	
44 (30.00) 44 (30.00) 45 (30.00) 46 (30.00) 46 (30.00) 46 (30.00) 47 (30.00) 47 (30.00) 47 (30.00) 47 (30.00) 48 (30.00)	ANDRONE ((Radio Shack)		170,900 Jeremy Moon, Christchurch,
40,000 Althrew W. Swarding, North Veracover, Britsch Collumbia 31,465 Septem Charicht, Yamouri, 31,465 Septem Charicht, Yamouri, 31,465 Septem Charicht, Yamouri, 31,465 Septem Charicht, Yamouri, 32,465 Septem Charicht, Yamouri, 33,465 Septem Charicht, Yamouri, 33,465 Septem Charicht, Yamouri, 33,460 Septem Charicht, Yamouri, 34,460				
37,410 Cheo Bobson, Victorias 1,287 One Arad, Rahama, Israel 4,550 Bryan Aloner, Calgary, Alberts Months 1,287 One Arad, Rahama, Israel 4,550 Months Months 1,287 One Arad, Rahama, Israel 4,550 Months 1,287 One Arad, Rahama, Israel 4,50 Months 1,287 One Arad, Rahama, I				
3.7.45	10,000			
Salik Kings	37,410			
3.1 485 3.5 50				
## ACT AMAY Agriculture Part ## ACT AMAY Agriculture ## ACT AMAY	31,485		CU*BER (Tom Mix)	MEGA-BUG (Radio Shack)
BAG-IT-AMM / Aardwarks 33.98			17,345 ★Stephane Asselin, Hauterive, Quebec	13,805 ★Ron Sujkowski, Bay City, MI
1535.50 *Filmothy Ruggles, Halsen, FL 160.00 173.50 173.	27,805	John Marcogliese, Eastchester, NY	DANGER RANGER (Med Systems)	
450,370 Jam Elriori, Meibourne, Australia 235,110 Xies Dorn, Eau Claire, WI 178,550 Apolio Latham Rich Square, NC	BAG-IT-MAN	N (Aardvark)		
141.790 Cornelius Geasar, Horherm, County and Germany (1997) (1998) County and Germany (1998) C	535,550	★Timothy Ruggles, Hialeah, FL		
13.04.00 Citade Coul. Herbertville, Outdoor	450,370			
301-00 Eric Lecrousel, Ottawo, Ontario 2327-70 (Loude Cote Herbretville, Outbee 4, 18-8) Sort Van Et, Lasring, IL Sort Va	418,790			
## Scott Van Ek, Lassing, I. ## Scott Van Ek,		West Germany		
BaseBall (Radio Shaek) Shawer Fisher Shawer				
480-0 Above Frainer, St. Downey, CA 480-0 Melter Trainips, Janewille, WI 234-0 Michael Rosenberg, Prestoraburg, KY 234-0 Michael Rosenberg, Prestoraburg, KY 234-0 Michael Rosenberg, Prestoraburg, KY 235-0 Seth Newman, Yardele, PA 236-0 Ian Loeppky, Blumenort, Maniloba BATS AND BUSG (71th RANIBO) 236-0 Seth Newman, Yardele, PA 236-0 Seth Ne				
48-0 Walter Trainings, Janesville, WI 23-39 Sharnon Blakey, Columbia, MO 27-0 Job Milligan, Juhan, PA 28-39 Sharnon Blakey, Columbia, MO 27-0 Job Milligan, Juhan, PA 28-30 Sharnon Blakey, Columbia, MO 27-0 Job Milligan, Juhan, PA 28-30 Sharnon Blakey, Columbia, MO 28-0 Job Milligan, Juhan, PA 28-0 Sharnon Blakey, Columbia, MO 28-0 Job Milligan, Juhan, PA 28-0 Sharnon Blakey, Columbia, MO 28-0 Job Milligan, Juhan, PA 28-0 Sharnon Blakey, Columbia, MO 28-0 Job Milligan, Juhan, PA 28-0 Sharnon Blakey, Columbia, MO 28-0 Job Milligan, Juhan, PA 28-0 Sharnon Blakey, Columbia, MO 28-0 Job Milligan, Juhan, PA 28-0 Sharnon Blakey, Columbia, MO 28-0 Job Milligan, Juhan, PA 28-0 Sharnon Blakey, Columbia, MO 28-0 Job Milligan, Juhan, PA 28-0 Sharnon, Part Milligan, Part Mi				
324-0 Michael Rosenberg, Prestorosburg, KY 23,859 Shannon Blakey, Columbia, MO 15,150 Theodore Laiham Jr., Rich Square, NC 297-00 Sefti Newman, Yardiey, Path Mark 1990 Sefti Newman, Yardi				
289-0 Jose Millagen, Julian, PA 19,880 Shawn Blakey, Columbia, MO 10,370 John Hurley, Lawrenceville, NJ 286-0 Seth Newman, Yardiey, PA 286-0 Seth Markiey, Pa Seth Newman, Yardiey, Pa Seth Ne				
28-0-0 Seth Newman, Yardiey, PA 186-0 In Loeppke, Bluemort, Manitoba 28.13 AND BUGS (THE RAINBOW) 28.280 Vernon Johnson, Parkville, MD 28.280 Vernon Johnson, Vernon, MD 28.280 Vernon Johnson, Vernon, MD 28.280 Vernon Johnson, Parkville, MD 28.280 Vernon Johnson, Vernon, MD 28.280 Vernon Johnson, Ve				
## 1878 AND BUGS (*THE RAINDOW) ## 24,000 *Michael Rosenberg, Prestorburg, KY *2,000 *Michael Rosenberg, Prestorburg, KY *4,827				
BATS AND BUGS THE FAINBOW 28.280				
24.600				
\$\frac{4}{2}\frac{5}{2} \frac{5}{2} \frac{8}{1} \frac{1}{2} \fra				
Age		★Michael Rosenberg, Prestonburg, KY		
3,800				
3,350 Eugene Watanabe, Sait Lake City, UT 107,370 Chris Haley, Auburn, CA MS. GOBBLER (Spectral Associates) 108,550 Shall Markin, Mytte Beach, SC 108,555 Shall Markin, Mytte Beach,				
BLACKBEARD'S ISLAND (*Tom Mix) 97,380 Sam Huighes, Colton, CA 108,550 \$fill Martin, Myrite Beach, SC 97,860 Woody Farmer, Acme, Alberta 157,000 Sam Huighes, Colton, CA 108,550 \$fill Martin, Myrite Beach, SC 157,000 Sam Huighes, Colton, CA 108,550 \$fill Martin, Myrite Beach, SC 157,000 Sam Huighes, Colton, CA 157,000 Sam Huighes, Colton, Canada, Canad				
## Mike Rice, Panama City, FL ## DFOOWARI (Arcade Animation) ## Sep3450				
BUZZARD BAIT Tom Mix FOODWAR Arcade Animation 351,900				
2,983,350 *Blossom Mayor, East Greenwich, NY 151,070 *Mathieu Paquin, Brossard, Ouebec 157,400 Sandra Maguire, Port Elgin, Ontario 104,075 2,902,700 Michael Popovich, Nashua, NH 194,095 Sispan, Fremont, OH 151,100 Douglas Rodger, Harvard, MA 105,000 151,100 Douglas Rodger, Harvard, MA 105,000 By Depted Perspect, Eatorville, WA 105,000 Mathieu Paquin, Brossard, Ouebec 105,000 105,000 Bud Seibel, Tumbler Ridge, Better, WG 105,000 Martin W. Grimm, Elviview, WG 1				
2,902,700 Michael Popóvich, Nashua, NH 104,075 Mike Scharf, Fremont, OH 151,100 Douglas Rödger, Harvard, MA 94,905 Stephane Asselin, Hauterive, Quebec British Columbia				
2,087.650 Edmund Greene, Nashua, NH 59.405 Stephane Asselin, Hauterive, Quebec 106.300 Bud Seibel, Tumbler Ridge, 59.105 Martin W. Grimm, Elixiew, WV 418,800 Keyin Kordran, Poughkeepsie, NY CANYON CLIMBER (Radio Shack) 113.700 *Bernd Pruetting, Scheibenhardt, West Germany 101.400 Mike Galasso, Richmond, KY PAC-TAC (Computerware) 101.400 Mike Galasso, Richmond, Mike Gala				
659,100				
502,656				
Alt				
Says000 Scott Oberholtzer, Lexington, MA 15,998 Susan Ballinger, Uxbridge, Ontario 32,36,200 Scott Oberholtzer, Lexington, MA 15,998 Susan Ballinger, Uxbridge, Ontario 33,600 Chris Melbye, Thief River Falls, MN 15,900 Scott Oberholtzer, Lexington, MA 15,998 Susan Ballinger, Uxbridge, Ontario 33,600 Chris Melbye, Thief River Falls, MN 14,266,600 Scott Oberholtzer, Lexington, MA 15,998 Susan Ballinger, Uxbridge, Ontario 15,635 Stephane Asselin, Hauterive, Quebec 1,651,300 Sean Whitley, Arvada, CO 2,100 Sergio Waisser, Mexico City, Mexico Scott Oberholtzer, Lexington, MA 1,500 Susan Ballinger, Uxbridge, Ontario 15,505 Jon Clevenger, Lima, OH 1,500 Susan Ballinger, Uxbridge, Ontario 1,500 Susan Ballinger, Uxbridge, Ontario 1,500 Jon Commello, Scarbovard, OR				
Agency A				
2,226,200 Scott Oberholtzer, Lexington, MA 15,988 Susan Ballinger, Uxbridge, Othario 33,600 Chris Melbye, Thief River Falls, MN 16,000 Meith Bishop, Warren, NJ 15,000 Susan Ballinger, Uxbridge, Othario 15,635 Curtis Frazier Jr., Enterprise, AL 1,266,000 Meith Bishop, Warren, NJ 15,000 Susan Ballinger, Uxbridge, Othario 15,500 John Davis, Scottsdale, AZ 1,500 Michael Sileo Jr., Glendale, NY 1,500 Julo Comello, Scaaborough, Ontario 123,000 Ian Loeppky, Blumenort, Manitoba 1,500 Kirstie Compton, Suffield, CT 3,297,500 Achad Kidder, Battle Creek, MI 2,000 Michael Melferd, Wren, OH 1,500 David Figel, Sardis, OH 2,000 Michael Melferd, Wren, OH 1,500 David Figel, Sardis, OH 2,000 Michael Melferd, Wren, OH 1,500 David Figel, Sardis, OH 2,000 Michael Melferd, Wren, OH 1,500 Diego Galliina, Summit, NJ 3,000 Michael Melferd, Wren, OH 1,500 Diego Galliina, Summit, NJ 3,000 Michael Melferd, Wren, OH 1,500 Diego Galliina, Summit, NJ 4,000 Michael Melferd, Wren, OH 1,500 Diego Galliina, Summit, NJ 4,000 Michael Melferd, Wren, OH 1,500 Diego Galliina, Summit, NJ 4,000 Michael Melferd, Wren, OH 1,500 Diego Galliina, Summit, NJ 4,000 Michael Melferd, Wren, OH 1,500 Diego Galliina, Summit, NJ 4,000 Michael Melferd, Wren, OH 1,500 Diego Galliina, Summit, NJ 4,000 Michael Melferd, Wren, OH 1,500 Michael Melferd, Wren,				
1,603,400 Shen Mansell, Calgary, Alberta Jeff Weaver, Gordonville, PA Jeff Stephane Asselin, Hauterive, Quebec Jeff Weaver, Gordonville, PA Jeff Stephane Asselin, Hauterive, Quebec Jeff Weaver, Gordonville, PA Jeff Stephane Asselin, Hauterive, Quebec Jeff Weaver, Gordonville, PA Jeff Stephane Asselin, Hauterive, Quebec Jeff Weaver, Gordonville, PA Jeff Stephane Asselin, Hauterive, Quebec Jeff Weaver, Gordonville, PA Jeff Stephane Asselin, Hauterive, Quebec Jeff Weaver, Gordonville, PA Jeff Denay, Beff Stephane Asselin, Hauterive, Quebec Jeff Weaver, Gordonville, PA Jeff Denay, Beff Stephane Asselin, Hauterive, Quebec Jeff Weaver, Gordonville, PA Jeff Denay, Beff Stephane Asselin, Hauterive, Quebec Jeff Weaver, Def Jeff Denay, Beff Stephane Asselin, Hauterive, Quebec Jeff Weaver, Def Jeff Denay, Beff Denay, Bef		★Glen Giacomelli, Woodbridge, Ontario	GLAXXONS (Mark Data)	
1,571,300 Jeff Weaver, Gordon/ille, PA 1,426,600 Sean Whitley, Arvada, CO 420,000 Keith Bishop, Warren, NJ 153,000 Michael Sileo Jr., Glendale, NY 130,000 Ian Loeppky, Blumenort, Manitoba CAWERN COPTER (THE RAINBOW) 1280 ★Sean Conner, Summit, NJ 1280 ★Sean Conner, Summit, NJ 1280 Joug Schwartz, Glendale, AZ 1,500 David Figel, Sardis, OH 968 Michael Melferd, Wren, OH 968 Michael Melferd, Wren, OH 970 John Rivers, North Adams, MA 1,500 Jel Lombardi, Newark, DE 262,900 ★Dan Hopper, Omaha, NE 152,400 Andrew Figel, Sardis, OH 111,300 Benny Pischka, Lloydminster, 152,400 Andrew Figel, Sardis, OH 111,300 Paul Midnoey, Inver Grove Hts., MN 111,300 Paul Midnoey, Inver G				
1,426,600 Sean Whitley, Arvada, CO 2,100 Xesgrgio Waisser, Mexico City, Mexico City, Mexico Sean Whitley, Arvada, CO 42,000 Keith Bishop, Warren, NJ 1,500 Susan Ballinger, Usbridge, Ontario 13,500 Michael Sileo Jr., Glendale, NY 1,500 Julio Comello, Scarborough, Ontario 132,000 Ian Loeppky, Blumenort, Manitoba 1,500 Kristie Compton, Kiffeld, CT Andy Dater, Medford, OR 1280 Xesan Conner, Summit, NJ 1,500 David Figel, Sardis, OH 483 Xesuan Ballinger, Usbridge, Ontario 1280 Andy Dater, Medford, OR 1,500 David Figel, Sardis, OH 483 Xesuan Ballinger, Usbridge, Ontario 1,500 David Figel, Sardis, OH 483 Xesuan Ballinger, Usbridge, Ontario 1,500 David Figel, Sardis, OH 1,500 Mental Medical Med				
420,000 Michael Sileo Jr., Glendale, NY 1,500 Susan Ballinger, Uxbridge, Ontario 133,000 Michael Sileo Jr., Glendale, NY 1,500 Lijulio Comello, Sacrobrough, Ontario 1280 Andy Dater, Medicard, OR 1,500 Andy Dater, Medicard, OR 1,500 David Figel, Sardis, OH 1,500 David Figel, Sardi				
153,000				
123,000				
CAMERN COPTER (THE ĀAINBOW) 1,500 Andy Dater, Medford, OR PIPELINE (THE RAINBOW) 1280 *Sean Conner, Summit, NJ 1,500 David Figle, Sardis, OH 483 *Susan Ballinger, Uxbridge, Ontario 1,500 David Figle, Sardis, OH 483 *Susan Ballinger, Uxbridge, Ontario 405 Joe Bironas, Crestwood, KY 1,500 Diego Gallina, Summit, NJ 405 Joe Bironas, Crestwood, KY 302 Lisa Ballinger, Uxbridge, Ontario 405 Livbridge, O				
1280				
1213 Doug Schwartz, Glendale, AZ 1,500 Diego Gallina, Summit, NJ 405 Joe Bironas, Crestwood, KY 968 Michael Mefferd, Wen, OH 1,500 Tim Hone, Eckville, Alberta 302 Lisa Ballinger, Usbridge, Ontario 790 John Rivers, North Adams, MA 1,500 Jeff Roberg, Winfield, KS 32,350 Xsusan Ballinger, Usbridge, Ontario CHOPPER STRIKE (MichTron) 1,500 Berndan Smith, Coral Springs, FL 10,750 32,350 Xsusan Ballinger, Usbridge, Ontario 162,400 Andrew Figel, Sardis, OH 1,500 Kevin Speight, Bridgewater, Novoscotia 8,950 Michael Derman, Tel-Aviv, Israel 113,200 Benny Pischke, Lloydminster, Sakatchewan 1,500 Rupert Young, Sheffield, MA 133,726 *Ed Meyer, Vancouver, British Columbia 111,300 Paul Mahoney, Inver Grove Hts., MN 15,000 *Joseph Calcaterra, Ridgewood, NY 133,726 *Ed Meyer, Vancouver, British Columbia 111,300 Paul Hotz, Herzlia B, Israel 164,750 Michael Charlmson, Spruce Grove, Alberta 2,795 Simon Clavet, Herzlia B, Shack) 147,4710 The Laura Hotz, Herzlia B, Israel 39,300 Asaron Snyder, Hazleton, PA <td></td> <td>+Coop Copper Cumpit N.I.</td> <td></td> <td></td>		+Coop Copper Cumpit N.I.		
968 Michael Mefferd, Wren, OH 1,500 Tim Hoven, Eckville, Alberta 302 Lisa Ballinger, Uxbridge, Ontario 963 Joseph Calcaterra, Ridgewood, NY 1,500 Joel Lombardi, Newark, DE PLANET INVASION (Spectral Associates) 790 John Rivers, North Adams, MA 1,500 Jeel Roberg, Winfield, KS 32,350 *Susan Ballinger, Uxbridge, Ontario 262,900 * Andrew Figel, Sardis, OH 1,500 Berendan Smith, Coral Springs, FL 10,750 Saul Kirsch, Ra'anana, Israel 8,950 Michael Derman, Tel-Aviv, Israel 10,750 Saul Kirsch, Ra'anana, Israel 8,950 Michael Derman, Tel-Aviv, Israel 10,750 Saul Kirsch, Ra'anana, Israel 8,950 Michael Derman, Tel-Aviv, Israel 11,500 Ruper Voung, Sheffield, MA 87,910 Ron Sujkowski, Bay City, MI 11,500 Ruper Voung, Sheffield, MA 87,910 Ron Sujkowski, Bay City, MI 15,000 Nubre Rall Rall NBOW) 87,910 Ron Sujkowski, Bay City, MI 90,114 Nubre Rall NBOW) 133,726 *Ed Meyer, Vancouver, British Columbia				
963 Joseph Calcaterra, Ridgewood, NY 790 John Rivers, North Adams, MA 1,500 Jeft Roberg, Winfield, KS 32,350 ★Susan Ballinger, Uxbridge, Ontario CHOPPER STRIKE (MichTron) 1,500 Brendan Smith, Coral Springs, FL 10,750 Saul Kirsch, Ra' anana, Israel 162,400 Andrew Figel, Sardis, OH 1,500 Rupert Young, Sheffield, MA 1,500 Pound Figel, Sardis, OH 1,500 Rupert Young, Sheffield, MA 1,500 Pound Figel, Sardis, OH 1,500 Rupert Young, Sheffield, MA 1,500 Rupert Young, Sheffield, MA 1,500 Pound Figel, Sardis, OH 1,500 Rupert Young, Sheffield, MA 1,500 Rupert Young, Sheffield, MA 1,500 Pound Figel, Sardis, OH 1,500 ★Joseph Calcaterra, Ridgewood, NY 1,500 Rupert Young, Sheffield, MA 1,500				
790 John Rivers, North Adams, MA CHOPPER STRIKE (MichTron) 262,900 ★Dan Hopper, Omaha, NE 1,500 Brendan Smith, Coral Springs, FL 262,900 ★Dan Hopper, Omaha, NE 1,500 Brendan Smith, Coral Springs, FL 262,900 ★Dan Hopper, Omaha, NE 1,500 Revin Speight, Bridgewater, Nova Scotia Nov				
CHOPPER STRIKE (MichTron) 262,900				
262,900 *Dan Hopper, Omaha, NE 1,500 Kevin Speight, Bridgewater, 162,400 Andrew Figel, Sardis, OH 130,200 Benny Pischke, Lloydminster, Saskatchewan THE INTERPLANETARY FRUIT FLY (THE RAINBOW) 111,300 Paul Mahoney, Inver Grove Hts., MN 87,600 David Figel, Sardis, OH 75,040 *Joseph Calcaterra, Ridgewood, NY 143,400 Morrison, Spruce Grove, Alberta Alberta 2,450 Keith Bishop, Warren, NJ 147,410 Laura Hotz, Herzlia, Israel 39,300 Aaron Snyder, Hazleton, PA 1,560 Michael Derman, Tel-Aviv, Israel 64,750 Bryan Bell, South Lyon, MI 24,090 Michael Derman, Tel-Aviv, Israel 39,300 Aaron Snyder, Hazleton, PA 1,560 Michael Derman, Tel-Aviv, Israel 5,000 *Joseph Calcatera, Ridgewood, NY 3,390 *Denis Dion Jr., Thetford Mines, Quebec Keith Bishop, Warren, NJ POOYAN (Datasoft) Simon Clavet, Thetford Mines, Quebec Keith Bishop, Warren, NJ POOYAN (Datasoft) 1,546,000 *Jeff Connell, Winona, MN 1,546,000				
162,400 Andrew Figel, Sardis, OH 130,200 Benny Pischke, Lloydminster, Saskatchewan 111,300 Paul Mahoney, Inver Grove Hts., MN 87,600 David Figel, Sardis, OH 15,000 Joseph Calcaterra, Ridgewood, NY 87,600 David Figel, Sardis, OH 15,000 Joseph Calcaterra, Ridgewood, NY 87,600 David Figel, Sardis, OH 15,000 Joseph Calcaterra, Ridgewood, NY 15,000 Joseph Calcaterra, R				
130,200 Benny Pischke, Lloydminster, Saskatchewan				
Saskatchewan				
11.300 Paul Mahoney, Inver Grove Hts., MN 87,600 David Figel, Sardis, OH JUNK FOOD (THE RAINBOW) 87,600 David Figel, Sardis, OH JUNK FOOD (THE RAINBOW) 163,150 *Paul Hotz, Herzlia B., Israel 147,410 Laura Hotz, Herzlia, Israel 54,950 Michael Derman, Tel-Aviv, Israel 39,300 Aaron Snyder, Hazleton, PA 24,090 Michael Derman, Tel-Aviv, Israel 37,550 Lenny Rockwell, Crouseville, ME 89-0 Peter Greenen, Sterling Hts., MI 89-0 Peter Greenen, Sterling Hts., MI 89-0 David Harris, Norco, CA 99,950 *Luanne Ashby, Phoenix, AZ COLORPEDE (Intracolor) 1,556,808 Scott Oberholtzer, Lexington, MA 2,614,230 Jerry Petkash, Warren, MI 185,950 *Matrix Bases Agains Mark Jansen, Franklin, WI 185,950 *Matrix Bases, Sioux Corlius Carnellin, Name And Agains Conclusion Conclused Color of Color o	130,200			
87,600 David Figel, Sardis, OH JUNK FOOD (THE RAINBOW) 3,390 ★Denis Dion Jr., Thetford Mines, Quebec CHUCKIE EGG (A&F) 75,040 *Jason Morrison, Spruce Grove, Alberta 2,795 Simon Clavet, Thetford Mines, Quebec 163,150 *Paul Hotz, Herzlia, Israel 64,750 Bryan Bell, South Lyon, MI POOYAN (Datasott) Keith Bishop, Warren, NJ 78,480 Oren Bergman, Herzlia B., Israel 39,300 Aaron Snyder, Hazleton, PA 1,546,000 *Jeff Connell, Winona, MN 24,090 Michael Derman, Tel-Aviv, Israel 37,550 Lenny Rockwell, Crouseville, ME 194,800 Helene Gilbert, Rouyn-Noranda, Quebec COLOR BASEBALL (Radio Shack) 17,760 Michael Chamberlin, Dawson Creek, British Columbia 103,950 Kevin Kordana, Poughkeepsie, NY 111-0 Ron Sujkowski, Bay City, MI THE KING (Tom Mix) 81,350 Paul Hotz, Herzlia B., Israel 89-0 Peter Greenen, Sterling Hts., MI 1,003,400 *Tim Rueb, Atlanta, GA 71,900 Laura Hotz, Herzlia, Israel 73-0 Kevin Osterude, Eau Claire, WI 75,550 Ken Krejca, Chicago, IL PROJECT NEBULA (Radio Shack) *Ken Krejca, Chicago, IL 8	111 200			
CHUCKIE EGG (A&F) 163,150				
163,150 *Paul Hotz, Herzlia B., Israel 147,410 Laura Hotz, Herzlia, Israel 24,090 Michael Derman, Tel-Aviv, Israel 39,300 Aaron Snyder, Hazleton, PA 24,090 Michael Derman, Tel-Aviv, Israel 37,550 Lenny Rockwell, Crouseville, ME 1546,000 *Jeff Connell, Winona, MN Helene Gilbert, Rouyn-Noranda, COLOR BASEBALL (Radio Shack) 17,760 Michael Chamberlin, Dawson Creek, 129-0 *Scott Rens, Sioux Center, IA Ron Sujkowski, Bay City, MI The KING (Tom Mix) 11,003,400 *Tim Rueb, Atlanta, GA 11,003,400 *Tim Rueb, Atlanta, GA 11,003,400 *Tim Rueb, Atlanta, GA 12,000 Michael Chamberlin, Dawson Creek, British Columbia 103,950 Kevin Kordana, Poughkeepsie, NY 111-0 Kevin Osterude, Eau Claire, WI 75,550 Ken Krejca, Chicago, IL Laura Hotz, Herzlia B., Israel 71,900 Laura Hotz, Herzlia, Israel 71,90				
147,410 Laura Hotz, Herzlia, Israel 64,750 Bryan Bell, South Lyon, MI POOYAN (Datasoft) 78,480 Oren Bergman, Herzlia B., Israel 39,300 Aaron Snyder, Hazleton, PA 1,546,000 ★Jeff Connell, Winona, MN 24,090 Michael Derman, Tel-Aviv, Israel 37,550 Lenny Rockwell, Crouseville, ME 194,800 Helene Gilbert, Rouyn-Noranda, Quebec COLOR BASEBALL (Radio Shack) 17,760 Michael Chamberlin, Dawson Creek, British Columbia 103,950 Kevin Kordana, Poughkeepsie, NY 111-0 Ron Sujkowski, Bay City, MI THE KING (Tom Mix) 81,350 Paul Hotz, Herzlia B., Israel 89-0 Peter Greenen, Sterling Hts., MI 1,003,400 ★Tim Rueb, Atlanta, GA 71,900 Laura Hotz, Herzlia B., Israel 73-0 Kevin Osterude, Eau Claire, WI 75,550 Ken Krejca, Chicago, IL PROJECT NEBULA (Radio Shack) 68-0 Darren Matusen, Bridgewater, MA LANCER (Spectral Associates) 1,705 ★Ken Krejca, Chicago, IL 56-2 David Harris, Norco, CA 99,950 ★Luanne Ashby, Phoenix, AZ 1,540 Tim Rueb, Atlanta, GA 1,001,051 *Mark Smith, Santa Ana, CA 41,700				
78,480 Oren Bergman, Herzlia B., Israel 39,300 Aaron Snyder, Hazleton, PA 24,090 Michael Derman, Tel-Aviv, Israel 37,550 Lenny Rockwell, Crouseville, ME 194,800 Helene Gilbert, Rouyn-Noranda, Ouebec Park Scott Rens, Sioux Center, IA 17,760 Michael Chamberlin, Dawson Creek, British Columbia 103,950 Kevin Kordana, Poughkeepsie, NY 111-0 Ron Sujkowski, Bay City, MI THE KING (Tom Mix) 11,003,400 The King (Tom Mix) 89-0 Peter Greenen, Sterling Hts., MI 1,003,400 The Krejca, Chicago, IL 81,350 Paul Hotz, Herzlia B., Israel 73-0 Kevin Osterude, Eau Claire, WI 75,550 Ken Krejca, Chicago, IL PROJECT NEBULA (Radio Shack) LANCER (Spectral Associates) 1,705 *Ken Krejca, Chicago, IL 1,760 Tim Rueb, Atlanta, GA 1,700 David Harris, Norco, CA 99,950 *Luanne Ashby, Phoenix, AZ 1,540 Tim Rueb, Atlanta, GA 1,700 Source Project (Intracolor) 74,250 Matthew Crabtree, Pittsburgh, PA 220 Jason Pelfrey, Germantown, TN 1,755,6808 Scott Oberholtzer, Lexington, MA 26,100 Lisa Ballinger, Uxbridge, Ontario 5,756,808 Scott Oberholtzer, Lexington, MA 26,100 Lisa Ballinger, Uxbridge, Ontario 220/113 *John Dupre, Mobile, AL 2,614,230 Jerry Petkash, Warren, MI 185,950 *Mark Jansen, Franklin, WI 220/130 Correlius Caesar, Gundelhardtstr,				
24,090 Michael Derman, Tel-Aviv, Israel 37,550 Lenny Rockwell, Crouseville, ME COLOR BASEBALL (Radio Shack) 17,760 Michael Chamberlin, Dawson Creek, 129-0 *Scott Rens, Sioux Center, IA 111-0 Ron Sujkowski, Bay City, MI 89-0 Peter Greenen, Sterling Hts, MI 73-0 Kevir Osterude, Eau Claire, WI 68-0 Darren Matusen, Bridgewater, MA 56-2 David Harris, Norco, CA COLORPEDE (Intracolor) 10,001,051 *Mark Smith, Santa Ana, CA 11,700 Susan Ballinger, Uxbridge, Ontario 5,756,808 Scott Oberholtzer, Lexington, MA 2,614,230 Jerry Petkash, Warren, MI 185,950 *Matrk Jansen, Franklin, WI 220/130 Helene Gilbert, Rouyn-Noranda, Ouebec Newin Corduna, Poughkeepsie, NY Michael Chamberlin, Dawson Creek, Michael Crouseville, ME 194,800 Helene Gilbert, Rouyn-Noranda, Ouebec Newin Kordana, Poughkeepsie, NY 10,03,950 Kevin Kordana, Poughkeepsie, NY Michael Chamberlin, Dawson Creek, British Columbia 103,950 Kevin Kordana, Poughkeepsie, NY 11,900 Ren King, Soott Chicago, IL 10,001,001,001 *Mark Smith, Santa Ana, CA 11,700 *Ken Krejca, Chicago, IL 11,705 *Ken Krejca, Chicago, IL 12,705 *Ken Krejca, Chicago, IL 13,705 *Ken Kreja, Chicago, IL 14,700 *Kevin Kordana, Poughkeepsie, NY 14,800 *Matthew Crabtree, Pittsburgh, PA 12,001,001,001 *Mathew Crabtree, Pittsburgh, PA 12,001,001,001 *Mathew Crabtree, Pittsburgh, PA 12,001,001,001 *Mathew Crabtree, Pittsburgh, PA 13,001,001,001 *Mathew Crabtree, Pittsburgh, PA 14,700 *Mathew Crabtree, Pittsburgh, PA 15,756,808 *Scott Oberholtzer, Lexington, MA 14,700 *Susan Ballinger, Uxbridge, Ontario 15,756,808 *Scott Oberholtzer, Lexington, MA 14,700 *Susan Ballinger, Uxbridge, Ontario 15,750,808 *Mathew Crabtree, Pittsburgh, PA 15,750,808 *Mathew Crabtree, Pittsburgh, PA 15,750,808 *Mathew Crabtree, Pittsburgh, PA 15,750,808 *Mathew Crabtree, Pittsburgh,				
COLOR BASEBALL (Radio Shack) 129-0				
129-0				
111-0 Ron Sujkowski, Bay City, MI 89-0 Peter Greenen, Sterling Hts., MI 73-0 Kevin Osterude, Eau Claire, WI 68-0 Darren Matusen, Bridgewater, MA 56-2 David Harris, Norco, CA COLORPEDE (Intracolor) 1,001,051 *Mark Smith, Santa Ana, CA 5,756,808 Scott Oberholtzer, Lexington, MA 3,355,248 Scott Drake, Pine City, NY 2,614,230 Jerry Petkash, Warren, MI THE KING (Tom Mix) *The KING (Tom Mix) *Tim Rueb, Atlanta, GA *Tim Rueb, Atlanta, GA *Luanne Ashby, Phoenix, AZ *Luanne Ashby, Phoenix, AZ *Matthew Crabtree, Pittsburgh, PA 220 Jason Pelfrey, Germantown, TN PYRAMID (Radio Shack) *YRAMID (Radio Shack) *PYRAMID (Radio Shack) 220/113 *John Dupre, Mobile, AL 220/115 Jeff Dempsey, Eatonville, WA 26,14,230 *Marren, MI 185,950 *Mark Jansen, Franklin, WI 220/130 *Cornelius Caesar, Gundelhardtstr,				
89-0 Peter Greenen, Sterling Hts., MI 1,003,400 *Tim Rueb, Atlanta, GA 71,900 Laura Hotz, Herzlia, Israel 73-0 Kevin Osterude, Eau Claire, WI 75,550 Ken Krejca, Chicago, IL PROJECT NEBULA (Radio Shack) 1,705 *Ken Krejca, Chicago, IL 1,705 *Ken Krej				
73-0 Kevin Osterude, Eau Claire, WI 68-0 Darren Matusen, Bridgewater, MA 56-2 David Harris, Norco, CA 68-0 Darren Matusen, Bridgewater, MA 56-2 David Harris, Norco, CA 69,950 *Luanne Ashby, Phoenix, AZ 60LORPEDE (Intracolor) 74,250 Matthew Crabtree, Pittsburgh, PA 1,504 Jason Pelfrey, Germantown, TN 1,705 *Ken Krejca, Chicago, IL 1,705 *Men Kenith, Santa Ana, GA 1,550 Matthew Crabtree, Pittsburgh, PA 2,818 Scott Oberholtzer, Lexington, MA 2,614,230 Jerry Petkash, Warren, MI 185,950 *Mark Jansen, Franklin, WI 220/113 *John Dupre, Mobile, AL 2,614,230 Jerry Petkash, Warren, MI 185,950 *Mark Jansen, Franklin, WI 220/110 Correlius Caesar, Gundelhardtstr,		Peter Greenen Sterling Hts MI		
68-0 Darren Matusen, Bridgewater, MA 56-2 David Harris, Norco, CA 99.950 *Luanne Ashby, Phoenix, AZ COLORPEDE (Intracolor) 74,250 Matthew Crabtree, Pittsburgh, PA 10,001,051 *Mark Smith, Santa Ana, CA 41,700 Susan Ballinger, Uxbridge, Ontario 5,756,808 Scott Oberholtzer, Lexington, MA 3,355,248 Scott Drake, Pine City, NY 2,614,230 Jerry Petkash, Warren, MI 185,950 *Mark Jansen, Franklin, WI 220/100 *Ken Krejca, Chicago, IL 7im Rueb, Atlanta, GA 220 Jason Pelfrey, Germantown, TN PYRAMID (Radio Shack) 220/113 *John Dupre, Mobile, AL 220/115 Jeff Dempsey, Eatonville, WA 2,614,230 Jerry Petkash, Warren, MI 185,950 *Mark Jansen, Franklin, WI 220/100 Cornelius Caesar, Gundelhardtstr,				PROJECT NERILL & (Radio Shack)
56-2 David Harris, Norco, ČA 99,950 *Luanne Ashby, Phoenix, AZ 1,540 Tim Rueb, Atlanta, GA COLORPEDE (Intracolor) 74,250 Matthew Crabtree, Pittsburgh, PA 10,001,051 *Mark Smith, Santa Ana, CA 41,700 Susan Ballinger, Uxbridge, Ontario 5,756,808 Scott Oberholtzer, Lexington, MA 26,100 Lisa Ballinger, Uxbridge, Ontario 3,335,248 Scott Drake, Pine City, NY LUNAR—ROVER PATROL (Spectral Associates) 220/113 *John Dupre, Mobile, AL 2,614,230 Jerry Petkash, Warren, MI 185,950 *Mark Jansen, Franklin, WI 220/130 Correlius Caesar, Gundelhardtstr.				
COLORPEDE (Intracolor) 74,250 Matthew Crabtree, Pittsburgh, PA 10,001,051 **Mark Smith, Santa Ana, CA 41,700 Susan Ballinger, Uxbridge, Ontario 5,756,808 Scott Oberholtzer, Lexington, MA 3,355,248 Scott Drake, Pine City, NY 2,614,230 Jerry Petkash, Warren, MI 185,950 **Mark Jansen, Franklin, WI 220/130 Cornelius Caesar, Gundelhardtstr.				
10,001,051 *Mark Smith, Santa Ana, CA 41,700 Susan Ballinger, Uxbridge, Ontario 5,756,808 Scott Oberholtzer, Lexington, MA 26,100 Lisa Ballinger, Uxbridge, Ontario 220/113 *John Dupre, Mobile, AL 3,355,248 Scott Drake, Pine City, NY LUNAR—ROVER PATROL (Spectral Associates) 220/115 Jeff Dempsey, Eatonville, WA 2,614,230 Jerry Petkash, Warren, MI 185,950 *Mark Jansen, Franklin, WI 220/130 Cornelius Caesar, Gundelhardtstr,				
5,756,808 Scott Oberholtzer, Lexington, MA 26,100 Lisa Ballinger, Uxbridge, Ontario 220/113 *John Dupre, Mobile, AL 3,3355,248 Scott Darke, Pine City, NY LUNAR—ROVER PATROL (Spectral Associates) 220/115 Jeff Dempsey, Eatonville, WA 2,614,230 Jerry Petkash, Warren, MI 185,950 *Mark Jansen, Franklin, WI 220/130 Cornelius Caesar, Gundelhardtstr,			41 700 Susan Ballinger Uybridge Optorio	
3,355,248 Scott Drake, Pine City, NY LUNAR—ROVÉR PATROL (Spectral Associates) 220/115 Jeff Dempsey, Eatonville, WA 2,614,230 Jerry Petkash, Warren, MI 185,950 ★Mark Jansen, Franklin, WI 220/130 Cornelius Caesar, Gundelhardtstr,				
2,614,230 Jerry Petkash, Warren, MI 185,950 ★Mark Jansen, Franklin, WI 220/130 Cornelius Caesar, Gundelhardtstr,				

SCOREBOARD

British Columbia 220/133 Robert Dickau, Sacramento, CA 220/153 Brett Casteel, Russell, PA lan Loeppky, Blumenort, Manitoba 220/155 RAAKA-TU (Radio Shack) 50 ★Ellen Ballinger, Uxbridge, Ontario ★Mike Bubb, Grafton, OH 50 ★Brett Casteel, Russell, PA ★Chris Cope, Central, SC 50 50 ★Aaron Flaugher, Hamilton, OH ★Richard Gain, Tyler, TX 50 50 50 50 ★John Kidd, Clarksboro, NJ ★Barney Laverty, Gauley Bridge, WV ★Jason Morrison, Spruce Grove, 50 Alberta 50 ★Michael Thomas, Flint, MI 40 David Bryan, Kentwood, I A 40 25 Jeff Dempsey, Eatonville, WA Ryan Devlin, Louisville, KY Joel Flaugher, Hamilton, OH Patric Flaugher, Hamilton, OH Russ Auld, St. Petersburg, FL 25 20 Russ Auld, 3
RADIO BALL (Radio Shack) ★Les Dorn, Eau Claire, WI ,465,000 1,103,090 Mike Sengstock, Meriden, CT RAINBOW ROACH (THE RAINBOW) 1,766,900 316,800 ★Nicky Rockwell, Crouseville, ME Don Wetherell, Charles City, IA ROAD RACE (THE RAINBOW)
5416.4 *Jon Hobson, Plainfield, WI 91 7 Bill Martin, Myrtle Beach, SC ROBOTTACK (Intracolor) ★Mike Scharf, Fremont, OH Wade & Troy Woods, Paul MacLennen, Tiverton, Ontario Edwin Prather & Cory Soper, 3.364.100 3 242 812 Oxnard, CA Horace Hamilton, Calgary, Alberta Randy Hankins, Tabor, IA 2.516.050 SEA DRAGON (Adventure International) ★Denis Dion Jr., Thetford Mines, Quebec 4.760 Simon Clavet, Thetford Mines, Quebec

George R. Fairfield, Victoria.

220/130

SKIING (Radio Shack) ★Mike Scharf, Fremont, OH 01:12 Sean Conner, Summit, NJ John Hokpins, Greenville, SC 12 02 Brian Austin, New Salisbury, IN Kelly Kerr, Wentzville, MO SKRAMBLE om Mix ★Paul Hotz, Herzlia, Israel 61,020 Steve Schutjer, Hazel Green, WI Michael Derman, Tel-Aviv, Israel 46 440 39,800 Laura Hotz, Herzlia, Israel Saul Kirsch, Ra'anana Israel Joel Kirsch, Ra'anana Israel Omri Arad, Ra'anana Israel 28,810 28,250 23,120 22,010 14 440 14,440 Oren Bergman, Herzlia B., Israel SNAKER (THE RAINBOW) ★Luanne Ashby, Phoenix, AZ Dan Sobczak, Mesa, AZ 1:24 Susan Ballinger, Uxbridge, Ontario Baiju Shah, Deep River, Ontario 1:37 1:59 Eric Burk, Williamsvill, NY STARFIRE (Intellectronics) ★Jeff Roberg, Winfield, KS TIME BANDIT (Mich Tron) ★Mark Wooge, Omaha, NE Doug Seibel, Tumbler Ridge, British Columbia 413.620 248 530 Sally Naumann, Hailey, ID Chris Oberholtzer, Lexington, MA 225,950 142,200 43,440 Fred Naumann, Hailey, ID Tim Rueb, Atlanta, GA 18,850 15,400 Denis Dion Jr., Thetford Mines, Quebec Simon Clavet, Thetford Mines, Quebec TRAILIN' TAIL (THE RAINBOW) 119,705 *Diego Gallina, S ★Diego Gallina, Summit, NJ 105,300 102,930 Jerry Dill, Frankfort, MI Philip Parent, Smiths Falls, Ontario 94.810 Jean-Marc Parent, Smiths Falls, Ontario 76.275 Michael Rosenberg, Prestonsburg, KY

TREKBOER (Mark Data) ★Warren Scollan, Seattle, WA 161 ★warren sconan, seatte, ...

TUT'S TOMB (Mark Data)

163,060 ★Michael McCafferty, Oceanside, CA

158,000 Chris Russo, Miami, FL

Judy Smith, Gresham, OR 106 460 Eileen Kaakee, Royal Oak, MI Gary Marshall, Layton, UT 104,360 72.140 Anthony Ebert, Galveston, IN UGH (Softek International) 4,875 ★Oren B ★Oren Bergman, Herzlia B., Israel ★Jäson Morrison, Spruce Grove, 2,260,200 Alberta WILDCATTING (Radio Shack)
250,450 ★John Kidd, Clarksboro, NJ Jack Ballinger, Uxbridge, Ontario Lisa Ballinger, Uxbridge, Ontario Mike Galasso, Richmond, KY 33,090 31 973 29,850 WILLY'S WAREHOUSE (Intracolor)
183,500 ★Alan Morris, Chicopee, MA 93 700 Craig Kluger, Miami, FL ZAXXON (Datasoft) ★Chris Oberholtzer, Lexington, MA 2.057.800 1,510,000 James Quadrella, Brooklyn, NY 666,000 401,900 Andy Green, Whitehall, PA Mike Hughey, King George, VA Chris Coyle, Selden, NY Sean Conner, Summit, NJ 370,400 134.800 133,000 Diego Gallina, Summit, NJ Kevin Kordana, Poughkeepsie, NY 126.500 96,300 88,500 Vernon Johnson, Parkville, MD Nanook Tuefferd, Hudson, NH

- Debbie Hartley

SCOREBOARD POINTERS

*Paul Hotz, Herzlia B., Israel

In conjunction with THE RAINBOW's Scoreboard, we offer this column of pointers for our game-playing readers' benefit. If you have some interesting hints and tips, we encourage you to share them by sending them to the Scoreboard, c/o THE RAINBOW.

MEMORANDUM FOR MADNESS

Scoreboard:

For all of you who have trouble with *Madness and the Minotuar*, here are a few hints.

To get out of the maze, find the small pit and jump over it, but if your physical condition is below 245, then you won't make it. To get past the hydra, find the rope and type in TIE HYDRA. Last but not least, to kill the Minotuar, you must have the sword, shield and power ring.

Charles Farris Lebanon, IL

PASSING KARRAK'S PIT

Scoreboard:

TRAPFALL (Tom Mix)

70,392

I have to write to advise the true Adventurers out there. Yes, there is a way to get past the pit in game I of *The Amazing Adventures of Karrak* (THE RAINBOW, Feb. '84), and I don't mean by cheating (example: altering the listing). If you will notice, when you take inventory you have a sack. By using the back-arrow sign (a shifted uparrow) you can inventory the sack. Alas, there is a pouch. GET POUCH and OPEN POUCH. 'GASP' a coin falls out. I must confess I beat my brains out for a few hours before my wife, who had no idea what was

going on, suggested the proper answer. Happy Adventuring!

> Wayne T. Holiman Mesquite, TX

Scoreboard:

I have heard of many people who are stuck in *The Amazing Adventures of Karrak* (THE RAINBOW, Feb. '84) at the pit with the slot. Put your sword in the sack and then GET the pouch. Open it and your troubles are over (at least for now!).

Susan Ballinger Uxbridge, Ontario



DIZZINESS REMEDY

Scoreboard:

In *Bedlam*, if you get a lobotomy, simply type PLUGH and it will cure the dizziness. What are the exact words to use to kill the dog? It always changes. Write to me if you know at 301 Caravel Dr., 19701.

Stephen Slack Bear, DE

ANSWERS TO ADVENTURES

Scoreboard:

I have solved the following Adventure games: The Amazing Adventures of Karrak, Black Sanctum, The Trip, Arconiax Assignment, Enrak, Merro's Crown, Raaka-Tu, Sir Randolph of the Moors and Unexplored Mansion. I would be more than glad to help anyone having problems with these Adventures. Just send me a SASE and I will get back to you as soon as possible.

In Sands of Egypt, does anyone know what to do when you're in the treasure room? Do you do something with the ladder or go above ground? Write to me at 51 Butler Pkwy., 07901.

Sean Conner Summit, NJ

DUNGEON-AID

Scoreboard:

I have the game *Dungeons of Daggorath* and have gotten to the fourth level. I can kill any creature there besides the galdrog. Can anyone help? Also, my heartbeat gets to about thirty beats a second. What creatures have hale or thews' flasks?

If you need help before the fourth level, the blob brings you a Vulcan ring on the first level. Type I FIRE. The Rime ring on second level is I ICE. Stow these and use them for the wizard's image. On the first level turn around, move, turn right, move seven times, turn right, move, move and there is a hole in front of you! On the second level, face down the long corridor, move down it to the end, turn left, move three times, turn right and follow the doors. When you are in a left and right corridor, go right. Go as far as you can and you've found it! On the third level, make sure you use a Solar Torch or the scorpion, and the wizard's image is hard to see. After the first time you attack the wizard's image, use a hale

For more help, send a SASE and the information you need to 32 Daniel St., 02159.

David Heinemann Newton, MA

SHAMEFULLY HIGH SCORE

Scorehoard.

An easy way to run up your score in *Shamus* as high as you like is to step back and forth repeatedly across the threshold between two rooms, firing continuously into the rooms. Can anyone explain how to use the keys to unlock the locks? And is there a green key? I can only find the red and the white keys. Write to me at P.O. Box 15564, 20003

John Tiffany Washington, DC

FUEL SHORTAGE

Scoreboard:

I need help on Zaxxon. After I get over 100,000 I start running out of fuel really fast. Any help or hints would be greatly appreciated. Please send to 10 Ronnie Lane, 12601

Kevin Kordana Poughkeepsie, NY

PYRAMID PLEA

Scoreboard:

I am a proud owner of a TRS-80 Color Computer. The very first game I got was *Pyramid*. I have tried to figure out how to solve this game and it has nearly driven me crazy. In the Jan. '85 issue of THE RAINBOW ("Scoreboard Pointers" Page 178), I found many people had solved it. I would like for anyone to write me and give me the solution to it. My address is 5208 Ventura Dr., 27406. Your help will be greatly appreciated.

Brian Beasley Greensboro, NC

Scoreboard:

If anyone wants a complete map and full directions for playing *Pyramid*, send \$1 and a SASE, or if you have one or two questions about it, send a SASE and I'll be glad to help. My address is Box 224, R0A 0CO.

Keep up the fantastic work on your great magazine.

lan Loeppky Blumenort, Manitoba

Scoreboard:

I have solved *Raaka-Tu* and *Pyramid* and I have a few pointers for my fellow Adventurers. For *Pyramid* don't worry about the scepter, you'll find you don't need it, so why waste valuable moves getting it. Also for those of you who are wondering if you can save your move for another day,

well here is the answer. Just type SAVE and you will see "ready cassette." Then when you want to start again just load in *Pyramid*, EXEC and type LOAD. You will see "ready cassette." then hit ENTER.

For *Raaka-Tu*, if you keep track of your moves when you get to the wall with the vines, you will find it very easy to get out at the end. Wait until the guards are coming from the right, then keep track of the moves in this way: 1-type LOOK; 2-type S; 1-type CLIMB VINES; 2-type E etc. If you do this 1-2-1-2 fashion, you will find that when it comes time to leave the temple if your count is -1- then it is safe to do so, but if your count is -2-, beware.

If you would like any information or if you would like the solutions for either Raaka-Tu or Pyramid then either send \$1 or a SASE to 2432 Capitol Hill Crescent N.W., T2M-4C2. Remember, your envelope should have a \$.37 stamp on it.

David R. Oelhaupl Calgary, Alberta

ADVANCING ON DONKEY KING

Scoreboard:

Are you tired of playing *Donkey King* because you can never seem to get past the first level? Try this: CLOADM the game, POKE 12889,2, now EXEC. This will let you start at the elevators level.

If you CLOADM, POKE 12889,10 you can start at the rivits level. And if you CLOADM, POKE 12889,18 you can start at the conveyor belt level.

Also if you CLDADM, POKE 12914, x you can pick how many extra men you want to play with. x being any number from one to 255.

Lastly, I'm looking for a CoCo pen pal with whom I can share ideas and knowledge. It might make these Wisconsin winters bearable. My address is 708 Michigan Ave., 53081.

Bill Bernico Sheboygan, WI

Scoreboard:

I have just recently solved the new graphics Adventure *Blackbeard's Island*. I would like to offer other Adventurers help. I have made a clue sheet with all 86 moves required to solve the game, but with one slight difference. This clue sheet has all the clues encoded so you can get only the clues you want without accidentally seeing the answer and spoiling the game. The clue sheet comes with the decoder. Anyone interested should send \$1 to 539 South Berthe Ave., 32404.

Mikel Rice Panama City, FL





How To Figure Foreign Currency Exchange Rates

By Gordon Lewin

ver the past several years, my wife and I have had the good fortune to be able to travel to several foreign destinations for a combination of business and vacation. Being typical tourists, we have always been on the lookout for good bargains and also for items that are difficult to come by at home.

A big hindrance to our shopping has always been converting the local currency to the U.S. dollar. Even using a hand-held calculator has proven to be irksome for me and doesn't appeal to my wife (who keeps forgetting the formula).

In any event, the following simple little program came about when I returned from Italy (lira=1677:1) where I made up a handwritten table to aid in converting sales prices to understandable costs.

Using the conversion table, for example, I want to buy a beautiful pair of Italian shoes, but the price tag says 76,555 lira. Wow! Get out your trusty copy of the table and look up 76,555

(Gordon B. Lewin is a materials manager at U.S. Divers Company, affiliated with Jacques Cousteau. He would like to someday write a book combining the subjects of his three hobbies: world travel, photography and computers.)

lira, which falls between \$40 and \$50. Sometimes having just that information can be enough to permit you to consummate the purchase, but if not, subtracting 67,000 lira (\$40) from the 76,000 leaves 9,000 or between \$6 and \$5, or about \$46 total. Interpolating in this manner, you can calculate any asking price.

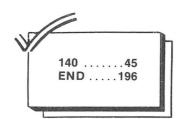
Foreign currency exchange rates are published in newspaper business sections or by local banks. Before embarking on a trip, just enter the name of the currency and its rate of exchange to one U.S. dollar for each country to be visited. Hit the ENTER key and *Voila!*

The program requires Extended

BASIC because of the use of the PRINT USING functions, but shouldn't be difficult to alter to Color BASIC. For those readers who live outside the U.S.. simply change the program to refer to your own currency wherever "U.S. dollars" occurs (lines 30, 40, 140, 210, 215). The program logic is merely a multiplication exercise using FOR/NEXT loops to print out the table. More time was spent in trying to do a reasonable job of error trapping than with the BASIC program. One last thing, if you modify Line 3 of the program to add the month of this issue and the page number, you will always be able to find the source of the program.

Conversion Table of Lira to U.S. Dollars at the Rate of 1677 to 1

U.S. Dollars		Lira	U.S. Dollars		Lira			
1	=	1677	2	=	3354			
3	=	5031	4	=	6708			
5	=	8385	6	=	10062			
7	=	11739	8	=	13416			
9	=	15093	10	=	16770			
11	=	18447	12	=	20124			
13	=	21801	14	=	23478			
15	=	25155	16	=	26832			
17	=	28509	18	=	30186			
19	=	31863	20	=	33540			
30	=	50310	40	=	67080			
50	=	83850	60	=	100620			
70	=	117390	80	=	134160			
90	=	150930	100	=	167700			



The listing:

'*********CONVERT****** '****1984. BY GORDON LEWIN****

'****MARCH 1985 RAINBOW*****

10 CLS(3)

20 PRINT@142,"MONEY";:PRINT@204, "CONVERSION"; : PRINT@270, "TABLE"; 30 PRINT@448, "U.S. DOLLARS IN FO REIGN CURRENCY";:GOSUB 390

40 CLS:PRINT@1, "THIS PROGRAM WIL L PRINT OUT A TABLE OF U.S. DO LLARS EXPRESSED AS A FOREIGN CUR ALL YOU NEED TO DO IS AN RENCY. SWER A FEW VERY SIMPLE QUESTIONS .":GOSUB390

50 PRINT@456, "ARE YOU READY?"

60 I\$=INKEY\$:IF I\$="Y" THEN70 EL SE₅₀

65 FOR X=1T0500:NEXTX

70 CLS(3):PRINT@32," WHAT FOREIG N CURRENCY NEEDS TO BE CONSIDER ";:PRINT STR ED FOR CONVERSION? ING\$(34,175);:INPUT FC\$

75 IF FC\$="" THEN 70

80 Z=127:Q\$=STRING\$(32,175)

90 IF LEN(FC\$)<23 THEN 135:PRINT @ 360, "USE AN ABBREVIATION!!":FO RX=1TO150: NEXTX

100 Z=Z+16

110 PRINT@352,STRING\$(32,Z)

120 FOR C=1TO 150:NEXT C

130 IFZ=255 THEN 140 ELSE 90

135 PRINT@352,Q\$:PRINT@352,FC\$; 140 PRINT@352,"HOW MANY "FC\$;:PR INT@384, "ARE THERE IN ONE U.S. D OLLAR ?"::INPUT FM\$

150 IF FM\$="" THEN 140 ELSE FC=V AL(FM事)

160 IF FC<>0 THEN 170 ELSE CLS(3):GOTO140

170 IF FC<0 THEN PRINT@352,STRIN G\$(128,175) ELSE 175:GOTO 140 175 CLS(3)

180 PRINT@258, "IS THE PRINTER RE ADY ? ? ? ":

185 I\$=INKEY\$: IFI\$="Y"THEN190 EL SE 180

190 CLS(3):PRINT@262, "PRINTING..

210 PRINT#-2:PRINT#-2, "CONVERSIO N TABLE OF "FC\$" TO U.S. DOLLARS AT THE RATE OF "FC" TO 1":PRINT #-2:PRINT#-2

215 PRINT#-2,TAB(4)"U.S. DOLLARS "FC\$;:PRINT#-2,TAB(44)"U

.S. DOLLARS

225 FT=FC

230 FORT=1 TO 20 250 PRINT#-2, USING" ### ###### ";T,

FT::FT=FT+FC:NEXT T

270 FOR T=30 TO 110 STEP 10:FT=F C*T

290 IF T>100 THEN 310 ELSE 250

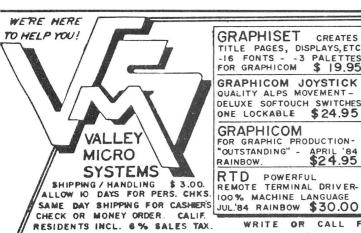
310 PRINT #-2:PRINT#-2:PRINT#-2

330 PRINT@262,"DONE PRINTING ": 350 PRINT@ 322, "ANOTHER CURRENCY

TABLE? (Y/N)"; 370 I\$=INKEY\$:IF I\$="" THEN 370 ELSE IF I = "Y" THEN 70 ELSE CLS(3):PRINT@270,"END";

380 GOTO 380

390 FOR X=1T01500:NEXT X:RETURN



GRAPHISET CREATES TITLE PAGES, DISPLAYS, ETC. -16 FONTS - -3 PALETTES FOR GRAPHICOM \$ 19.95

GRAPHICOM JOYSTICK QUALITY ALPS MOVEMENT DELUXE SOFTOUCH SWITCHES, ONE LOCKABLE \$24.95

GRAPHICOM FOR GRAPHIC PRODUCTION"OUTSTANDING" - APRIL '84
RAINBOW. \$24.95

RTD POWERFUL REMOTE TERMINAL DRIVER- VMS-BBS THE PROFESSIONAL BBS WRITTEN BY JEFF FRANCIS FEATURE FILLED, 100% M.L. EXTREMELY VERSATILE! COCOI/II 64K \$150.00

COLOR-80 BBS
LATEST EDITION, ONE OF
THE BEST BOARDS AVAILABLE
NEW LOW PRICE \$125.00

SERIAL TO PARALLEL CONVERTER WITH
QUALITY CRYSTAL SWITC
POWER SUPPLY, & ALL
CABLES INCLUDED.
NEW LOW PRICE \$49.95

BASTXT Lnew ADDS 17 NEW COMMANDS AND HIGH DENSITY TEXT SCREEN TO BASIC. MIXES TEXT & GRAPHICS IF DESIRED EASILY MODIFIED. 64 K-100% M.L. \$34.95

"FC\$:PRINT#-2

DISK DISASSEMBLER TACKLES SEGMENTED AND AUTO- EXECUTING FILES &
MUCH MORE - BEST WE'VE
SEEN YEL LOWEST PRICE
(New \$24.95

CUSTOM DOS (new)
ADDS 14 NEW DISK COMMANDS - USE D.S. DRIVES!
IMPROVED DIRECTORY & BOOT. EPROM COMPATIBLE\$ 44.95

FOR FREE CATALOG . DEALER INQUIRIES INVITED WRITE OR CALL MODESTO, 200. CA

ROSEBURG AVE. - SUITE 801 BBS & ELECTRONIC SHOPPING . (209) 526-2030 . VOICE PHONE : (209) 529-4343

WHERE'S-IT

by C.E. Laidlaw

What programs are on this disk? Which disk is my WIDGET program? WHERE'S-IT will answer these questions for you and maintain disk directory index files with up to 972 programs in each. Completely user-friendly, just run WHERE'S-IT and follow the prompts to:

Create index files holding up to 972 programs

Load or save existing index files

Add, delete or update index files for a
specific disk

Sort index files alphabetically with a machine language sort

List index files to screen

Print index out with 162 programs to the page

Disk only.....\$19.95 (32K Extended Color BASIC)

We are also a dealer for the following companies:

Moreton Bay Software
Computerware
Spectrum Projects
Mark Data, Amdek, Epson
Pal Creations, Tom Mix
PBH Computer, Inc.
Spectral Associates,
Cognitec, Elite Software
Prickly Pear, Botek
Cobra Software
and many more fine companies



SOFTWARE HARDWARE

1636 D Avenue, Suite C National City, CA 92050 After hours: BBS 619-474-8981 Orderline: 619-474-8982



FEATURES

Creates stand-alone programs

Up to 100 rooms, 60 objects, 30 command words, and 9 conditional flags
Supports tape and disk output

Optional printer output of important sections during creation of ADVENTURE
Complete documentation
Includes sample ADVENTURE
Works with all models of the CoCo except MC-10
Requires 32K Extended Color BASIC



by Terry A. Steen

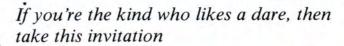
Control your submarine in its efforts to destroy the enemy fleet. You must launch your sub to surface missiles while avoiding the depth charges. Five different types, hi-res graphics and spectacular sounds. Also a talking version included at no extra charge for those who have an SC01 based voice pack. Four screens and progressive difficulty make this all machine language program a real bargain.

Cassette: \$19.95 Disk/Amdisk: \$24.95

U.S. COD orders accepted, no charge cards please. Shipping and handling \$3.00 California residents please add 6% sales tax

16K ECB





Calling All CoCo CoCo Nuts

By Paul Poulosky

his 16K ECB graphics display explains exactly why there are so many CoCo widows. I was inspired to write CoConuts on the first anniversary of having my CoCo.

CoConuts is a program designed to be expanded upon. We challenge ambitious programmers to make another screen or two. Good luck!

(Paul Poulosky, a junior in high school, has been a CoCo owner for a year. His hobbies are playing fantasy games, reading science fiction/fantasy books and computer programming.)

200 184 500 147 670 171 END ... 164

The listing:

0 'COPYRIGHT (C) BY PAUL POULOSK

7/22/84

10 PMODE4,1

20 SCREEN1,2

30 PCLS

40 DRAW"BM80,168;R96;U65;L96;D65

50 DRAW"BMB0,133;R96"

55 PAINT (81,132),1,1

60 DRAW"C2; BM165,128; L7; U4; R7; D4

70 DRAW"BM176,128;L6;R6;U4;L6;R6; ;U4;L6;R6;U4;L6;R6;U4;L6;R6;U4;L 6"

80 DRAW"BM80,128;R6;L6;U4;R6;L6; U4;R6;L6;U4;R6;L6;U4;R6;L6;U4;R6

90 DRAW"C1; BM85, 138; D30; R86; U30; L86"

100 PAINT (84,138),1,1

110 DRAW"C0; BM80, 133; R96"

120 DRAW"C1; BM100,165; R56; U3; L56: D3"

130 PAINT (101,164),1,1

```
140 DIMA(5,5)
150 DRAW"BM100,140; D3; R3; U3; L3"
160 PAINT (101,141),1,1
170 GET (99,139) - (104,144),A
180 FORX=95 TO 160 STEP5
190 PUT(X,139)-(X+5,144),A
200 NEXT
210 PUT(160,139)-(165,144),A
220 DIMB(5.5):GET(100.139)-(105,
230 FORX=91T0161 STEP 5
240 FUT(X,146)-(X+5,151),B
241 FUT(X.153)-(X+5.158),B
245 NEXT
250 DRAW"BM60,12;R136;D70;L136;U
260 DRAW"BM65,17;R100;D60;L100;U
60"
270 DRAW"BM170,77;R22;U30;L22;D3
Ø"
280 CIRCLE(177,20),3
290 CIRCLE(188,20),3
300 CIRCLE(181,33),6
310 DRAW"BM120,103;U21;L1;D21;L1
; U21"
400 DRAW"BM100,20;R5;D10;L5;R10;
L5; U10; R5"
410 DRAW"BM114,18;R2;D1;L2;D1;R2
; D3; L1; U3"
420 DRAW"BM120,20;D10;U10;F5;E5;
D10"
430 DRAW"BMB1,35;R6;L6;D6;R6"
440 DRAW"BM90,35;R6;D6;L6;U6"
450 DRAW"BM99,35;R6;L6;D6;R6"
460 DRAW"BM108,35;D6;R6;U6;L6"
470 DRAW"BM117,35;D6;U6;F6;U6"
480 DRAW"BM126,35;D6;R6;U6"
490 DRAW"BM135,35;R6;L3;D6"
500 DRAW"BM144,35;R6;L6;D3;R6;D3
; L6"
510 DRAW"BM99,45;R6;D6;L6;U6"
515 LINE(108,45)-(111,51),PSET
520 LINE(111,51)-(114,45),PSET
530 DRAW"BM117,45;R6;L6;D3;R4;L4
; D3; R6"
540 DRAW"BM126,45;R6;D3;L6;U3;D6
;U3;R3;F3"
550 DRAW"BM108,55;D6;U6;F3;E3;D6
560 DRAW"BM117,55;F3;E3;G3;D3"
 570 DRAW"BM81,65;R6;L6;D6;R6"
580 DRAW"BM90,65;R6;D6;L6;U6"
 590 DRAW"BM99,65;R6;L6;D6;R6"
 600 DRAW"BM108,65;R6;D6;L6;U6"
 610 DRAW"BM126,65;R6;D6;U3;L6;D3
 ; U6"
 620 DRAW"BM135,65;D6;U6;F6;U6"
```

630 DRAW"BM144,65;D6;R4;E2;U2;H2

```
: L4"
640 FORX=1T02000:NEXT
650 FORX=66T0164
660 LINE(X.18)-(X.76).PRESET
670 NEXT
680 DRAW"BM103,20;R6;L3;D6"
690 DRAW"BM112,20;D6;U3;R6;D3;U6
700 DRAW"BM121,20;R6;L6;D3;R4;L4
710 DRAW"BM85,30;R6;D3;L6;U3;D6;
U3:R3:F3"
720 DRAW"BM94.30;R6;D6;U3;L6;D3;
U6"
730 DRAW"BM103,30;R6;L3;D6;R3;L6
740 DRAW"BM112,30;D6;U6;F6;U6"
750 DRAW"BM121,30;R5;F1;D2;L6;R6
: D2; G1; L5; U6"
760 DRAW"BM130,30;R6;D6;L6;U6"
770 DRAW"BM139,30; D6; E3; F3; U6"
780 CIRCLE(115,76),50,,.4,.5,.99
790 CIRCLE(115,56),50,,.4,.5,.99
800 CIRCLE(115,71),50,,.4,.5,.99
810 CIRCLE(115,66),50,,.4,.5,.99
820 CIRCLE(115,61),50,,.4,.5,.99
830 PAINT (67,71),1,1
835 PAINT (67,61),1,1
840 FORX=1T02000:NEXT
900 FORX=66T0164
910 LINE(X,18)-(X,76), PRESET
920 NEXT
930 GOTO 400
1000 GOTO 1000
                               0
```

One-Liner Contest Winner . . .

Echo plays musical notes that you specify. Just type in a note letter and an octave number and press ENTER. You can put more than one combination on a line.

The listing:

0 CLSRND(8):DIMA\$(256):PLAY"03T2
55L255":INPUT"NOTES":A\$:FORX=1T0
LEN(A\$):A\$(X)=MID\$(A\$,X,1):A=VAL
(A\$(X)):IFA<6ANDA>0THENPLAY"0"+A
\$(X):NEXTX ELSEIFA\$(X)>"G"ANDVAL
(A\$(X))=0THENPRINT"ERROR!":END E
LSEFORZ=20T01STEP-1:V\$="V"+STR\$(
Z):PLAYA\$(X)+V\$:NEXTZ,X:RUN

Joshua Jackson South Salem, NY

(For this winning one-liner contest entry, the author has been sent copies of both *The Rainbow Book Of Simulations* and its companion *Rainbow Simulations Tape.*)

*

SUPER BACK-UP UTILITY®

...WITH S.B.U. FROM COMPUTIZE - YOU'LL NEVER NEED ANOTHER BACK-UP UTILITY FOR YOUR COCO SUPER BACK-UP UTILITY WILL PERFORM ALL OF THE FOLLOWING FUNCTIONS:

- TAPE TO TAPE (Regardless of most protection schemes!)
- TAPE TO DISK (Move Cassette programs to Disk!)
- (For those Cassette programs that conflict WITH Disk operating systems.) AUTO RELOCATE
- DISK TO TAPE (Place Disk programs onto Cassette) 4
- (Our powerful Spit-N-Image Program, **DISK TO DISK** 5 Regardless of protection schemes!)
- MENU DRIVEN!
- **REQUIRES 32K EXTENDED COCO**
- REQUIRES 1 OR 2 DRIVES (For Disk Functions)
- ALL MACHINE LANGUAGE!!!

COMPARE WITH OTHER INDIVIDUAL PROGRAMS COSTING IN EXCESS OF \$100.00 OR MORE!!!

ONLY \$49.95!

(SUPPLIED ON DISK)

X>

T.T.U. - TRIPLE TRANSFER UTILITY (C)

M/L For Cassette & Disk Program Transfer

Transfer contents of disk to tape * Transfer content of tape to disk * "Select" or "All" Option * Will automatically relocate those cassette programs that conflict with the disk operating system! Will display machine language program address * Copies ASCII, Basic, & Machine Language Programs * All contained in 1 menu driven program!!!

REQUIRES 32K CC EXT.

Disk \$24.95

Cassette \$19.95



SPIT-N-IMAGE (C)

M/L Disk Back-Up Utility



There is no need to suffer the heartbreak of crashed disks any longer. Spit-N-Image will create a mirror image of your valuable disk programs which do not respond to normal back-up functions Will also initialize and back-up in one pass. Data processing experts always insist on haviang a back-up - it's good practice - Don't wait!

REQUIRES 32K CC AND 1 OR MORE DRIVES DISKETTE \$34.95



ONLY

\$99.95

Have you ever lost a program and didn't have a backup? Sooner or later it happens to everyone. The best policy is to have a backup of EVERYTHING. Thus comes the problem - many programs are copy-protected and won't backup easily. So how do you protect your investment

The MASTER KEY was developed just for this problem. Just as a master key unlocks all doors in a building, this MASTER KEY will <u>unlock ALL programs</u> that load into your CoCo's memory. And it s as easy as flipping a switch! Once you have control, ou can copy your programs, proctected or not, to tape or disk. The MASTER KEY

Complete Disassembler Display/Change memory in Hex or ASCII View memory in all Graphic Modes Versatile printer routine for All printers Rom-Fak model has gold contacts for more reliable operation.

Comprehensive, easy to follow manual

Search for text or M/L routines Copy memory from one location to another Write memory to tape or disk Defeats All auto-start programs, Rom-Pak design allows use of disk system while Master Key is installed. Works with all versions of CoCo, 16k+

The MASTER KEY may be used to convert many programs from tape to disk, and yet does not require a background in assembly language. Using the METHODS section of the manual will allow even a novice to copy many programs. As you learn more about assembly language, you'll be able to use the MASTER KEY's full capabilities.

ou can leave the MASTER KEY plugged in all of the time. The gold contacts will improve the 1/O of your disk drive, and at the flip of a smitch you'll have a quality disassembler. The Examine/Change feature will allow the entry of short M/L routines, and the Screen command will allow quick debugging of graphic screens.

<u>30 DAY MONEY BACK GUARANTEE</u>: If you find any program that MASTER KEY cannot <u>take</u> control of, simply return for a full refund.

N O T I C E: The MASTER KEY has been developed as an educational tool and to allow the user to examine and save for archival purposes programs he/she has purchased.

NOTE: "F" board owners must cut a capacitor - details included.

SUPPLIED ON ROM PAK MODEL #MK035

"BARMASTER" (C)

PROFESSIONAL BARTENDERS GUIDE

*Menu Driven! *Over 180 Listings! * Easy to add your favorites! * Print to 3X5 Index cards for easy reference! * Access drink by name or liquor content! *Utilizes computizes "Fast Access Record Retrieval" (any record in just two reads!)

Requires 32K CC and 1 Drive

Disk Only \$19.95

64K-IT®

New - From Computize

Enables the Full 64K of RAM in your 64K Color Computer. Provides up to an additional 16K of RAM. Permits you to change, modify or copy the BASIC, EXTENDED BASIC, ROMPACK, OR DISK PACK

REQUIRES 64K COCO

TAPE \$11.99

TAPE-DIR®

Tape-Dir is a basic program used for displaying and/or printing information about cassette files In addition to listing file name, Tape-Dir will list and/or print the following information

- Type of file Machine Language, Data, Basic
- Format Binary or ASCII
- M/L Start, End, and Execute addresses
- For Basic & Data Files will show number of bytes used! Useful for sorting out your tape files by those that will run on your 16K. 32K machine!
- Will bypass tape I/O errors no aggravation!

REQUIRES 16K EXTENDED COCO, CASSETTE PLAYER. (PRINTER OPTIONAL)

CASSETTE \$11.99

OS-9 ***** "CONVERT" ****

New - From Computize

This high quality M/L Utility will CONVERT Standard OS-9 Formatted Files/Disks (514") to Radio Shack OS-9 to run on your COCO. Will also convert 40 track to 35 track if you require. Runs under COCO OS-9

REQUIRES 64K COCO AND 2 DRIVES

SUPPLIED ON DISK ONLY \$49.95

FASTAPE

The Next Best Thing To A Disk Drive From Spectro Systems

Fastape gives you cassette I/O at 3000 baud-Twice Normal Speed. It uses the high-speed (POKE 65495,0) mode, and makes it convenient to stay in this mode throughout. Features automatic adjustment of cassette and printer parameters when speed mode is changed. Controlkey functions for many Basic commands and for changing speed modes. Compatible with all tape file types. Can be used with Telewriter-64 and many other utilities

"I strongly recommend this fine utility" Rainbow, 7/83 "A treat for those without disk systems" Hot Coco, 10/83

REQUIRES 16K COCO

CASSETTE \$21.95

THE PEEPER

A Unique Interrupt-Based Program Tracer From Spectro Systems

Imaging being able to monitor the operation of a machine-language program While It Is Running To display any portion of memory in any of Coco's 26 documented display modes, and to move through memory using the arrow keys. To slow the action to a crawl, or freeze it at will. Instantly switch between watching the output of your program and watching Peeper dynamically display (on screen or printer) the contents of the 6809's registers and stack, showing changes as they are happening. In the slowest speed mode, Peeper provides continuous single-stepping, faster modes give a coarser trace. Or, halt the action and single-step by repeatedly pressing the space bar. Peeper supports breakpoints, memory examine/change, and more. Think how much easier it would be to modify someone else's ML software if you could determine what routines were being executed at any given point!

For fun, (and this requires no ML experience), use Peeper with arcade games, watching the fine details of the animation effects in slow motion. See how the game looks and plays in other graphics modes. Or watch what is happening on "hidden screens" you never see. (Makes a superb demonstration)

REQUIRES 16K COCO ON CASSETTE (COPYABLE TO DISK) WITH ASSEMBLER LISTING

\$24.95



Check or M.O. • Add \$3.00 shipping • PA residents add 6% sales tax

The first of a two-part series

So, You Want To Sell Your Software . . .

By Susan P. Davis

any people write a piece of software for the Color Computer which they think other people could use and enjoy. There are three ways to go: donating the software to the public domain by sending it to CompuServe or other bulletin boards, submitting it for publication in THE RAINBOW or another magazine, or trying to sell the program.

People who decide to sell a piece of software that they have written then need to decide whether they want to sell it themselves or if they want to submit it to an existing software house. There are many pros and cons related to each choice. The final decision is truly an individual one, often based on the amount of time and money the author has to invest in his/her program and not on the quality of the software.

Let's examine the advantages and pitfalls of trying to sell the software yourself. Next month, we will discuss having a software house market your

(Susan Davis has a master's degree in linguistics and has taught Spanish on the high school and college levels. She is also a CLU with seven years experience in the life and health insurance fields. In addition, she designs educational programs for Sugar Software, which she owns with her husband, Gary.)

program.

The first decision that you have to make is the form that your business will take. If you are setting up the business all alone, you can either have a sole proprietorship or form a corporation. Either way, you may have as many employees as you wish. If you plan to start the business with another person, you can have a joint venture, a partnership or a corporation. If you have had a business before, you know the pros and cons of each of these business forms. If not, you will want to consult your attorney, Small Business Association and/or accountant before making your decision.

Now, let's get a business name. Choose a name that tells something about you or your business. After you decide on a good name, you will have to register this name with the state in which you reside. You will have to pay a fee for this. The state will look into its database of registered company names to make sure that you have not used a name already in use or a name that is very close to one already in use. You should not start using your business name until your state has given you the go-ahead.

After the state OKs your new business name, it will tell you about even more fees which you must pay. The state, county and local fees that you will have to pay vary, and you must find out about them. Ignorance here is no excuse and you will probably have penalties to pay if you do not pay all your fees at this time. You will need a vendor's license for each state in which you will be selling your software. This license is renewed annually. This vendor's license obligates you to collect and send in at various intervals the sales tax levied by your state.

You will need to establish a business relationship with a bank. You will need a business checking account and perhaps business credit cards. The "rules" for this account will probably be different from those of your personal account, and you will probably incur more charges. Do you need a loan to get started in your business or to expand? Your business banker will be able to help you here. If you want to offer your customers charge privileges, you will need to apply to be a Visa/Mastercard merchant. The bank will take a certain percentage of each charge card sale; the newer you are, the higher your percentage. You will probably find this well worth it, as phone customers can easily order after they have all the information they need about your program.

You and the bank will need to decide how much money you can afford to lose if things do not go well at first. If you do not achieve these financial goals, you will need to do a serious reevaluation.

Finally, you are ready to start! Where will you conduct your business — from your home or from a separate office or store? If you will be leasing a store or office, you will need money for rent and utilities before the first sale is even made. Most people start their Color Computer businesses from home. Even THE RAINBOW started off in Lonnie Falk's house, eventually taking over every inch of habitable space. (Now I hear they have had to expand the Prospect, Ky., city limits to accommodate all the growth.) If you will be running your business from home, do you have a separate place to do the business? The IRS has tightened up on the "office in the home" rule, and you must have a place where you conduct your business and don't do anything else. You will need to decide if you will get a separate business telephone, if you will get an 800 number and how you want to handle your long distance calls.

Next, survey your equipment. Do you have enough computers, tape recorders, disk drives (according to Gary, my husband, no one ever has enough disk drives) and controllers and tape duplicators to fill orders? If you

don't, will you buy the machines or will you have your duplication professionally done?

You will need to find bulk suppliers of tapes and diskettes, mailing envelopes and office supplies. Many of these places advertise. You can probably get good recommendations from other software houses and local business-people.

There is a lot of artwork to consider in the software publishing business. You will need to develop a logo to use on your business cards, letterhead and magazine advertising. Documentation booklets need to be designed. You will need to decide what kind of packaging you want to use and who will do it for you. All of these things will have to be printed. You can attempt to do this all yourself or you can hire someone else to do it for you. The people who purchase software have become more sophisticated, and ads that were acceptable two years ago are no longer seen. Your ads need to attract their attention so that they can read about your product.

Now is the time to set up an advertising budget. This will help you and/or your advertising director or agency

make the best decisions. Will you advertise only in magazines like RAINBOW, which are Color Computer specific or will you also consider magazines which deal with other computers? A call or letter to the advertising manager will get you a copy of the latest rate card. The ad rates, sizes of the ads, discount terms and conditions, mechanical requirements, issuance and closing dates will all be spelled out for you.

You will also have to consider attending trade shows. There are Color Computer specific shows such as the RAINBOWfests and there are business software shows, educational software shows, etc., for all home computers.

You will need to develop a catalog, a flyer or both. Will you do mass mailings and how will you develop your mailing list? You might investigate the advantages of purchasing a bulk mailing permit or renting a post office box. You will need to develop policies about COD orders, extending credit and your collection procedures. Obviously, there are many factors which will influence your decision. Once you have considered the above questions, and others that may occur to you, it's time to start. You are ready to go! Good luck!

COLOR COMPUTERS

CALL TOLL FREE 1-800-248-3823

COLOR COMPUTER, DISK DRIVE AND PRINTERS

COLOR COMPUTER SOFTWARE

		LIST PRICE	OUR PRICE		OUR PRICE
26-3136 16K Extended Color Computer 2			120.00	Telewriter 64 Tape \$	49.95
26-3127 64K Extended Color Computer 2	\$	199.95	\$ 169.00	Telewriter 64 Disk\$	59.95
26-3029 Disk Drive 0 for Color Computer	. \$	349.95	\$ 295.00	VIP Writer\$	59.95
26-1161 Disk Drive 1. 2. 3 for Color Computer	\$	279.95	\$ 230.00	VIP Speller \$	49.95
26-1276 DMP-10580 cps Dot Matrix	\$	199.95	\$ 169.00	VIP Database \$	59.95
26-1271 DMP-110 50/25 cps Triple Mode Printer	\$	399.95	\$ 299.00	VIP Terminal Disk	49.95
26-1255 DMP-120 120 cps Dual Mode Matrix	\$	499.95	\$ 385.00	TOM MIX Software	CALL
26-1257 DWP-210 14 cps Daisy Wheel Printer	\$	459.00	\$ 485.00	RADIO SHACK Software	15% Off

OTHER PRINTERS AND ACCESSORIES

MONITORS

	OUR PRICE		OUR PRICE
EPSON Printer \$	CALL	COMREX 12" Green Monitor\$	95.00
OKIDATA Printer\$	CALL	COMREX 12" Amber Monitor	110.00
STAR GEMINI 10X Printer \$		COMREX 13" Color Monitor\$	285.00
COMREX CR-II Daisy Wheel Printer \$	415.00	AMDEK 300A Monitor\$	155.00
C ITOH 8510 Prowriter Printer\$	335.00	VIDEO PLUS Monitor Adaptor \$	CALL
BOTEK Serial to Parallel Interface	59.00	GORILLA Monitor	85.00

COLOR ACCESSORIES

	LIST PRICE	1	OUR		LIST		OUR
26-2226 RS-232 Program Pak \$	79.95	\$	68.00	26-3018 Extended Basic Kit	39.95	S	34.00
26-3012 Deluxe Joystick (EACH) \$	39.00	\$	34.00	26-1175 Direct-Connect Modem I	99.95	\$	85.00
26-3017 64K RAM Kit	69.95	\$	59.00	26-1173 Direct-Connect Modem II	199.95	\$	169.00
26-3008 Joysticks\$	24.95	\$	21.00	Signalman Modem 300/1200 Baud \$	399.00	S	275.00
26-3016 Keyboard Kit	39.95	\$	34.00	Hayes Modems		\$	215.00

All prices and offers may be changed or withdrawn without notice. Advertised prices are cash prices. For shipping, add 2% (minimum shipping charge \$3.00), C.O.D. accepted. [\$4.00 charge per carton on C.O.D. Call for further COD information.]

Now . . . from the makers of THE RAINBOW comes the new, expanded



Just because we at PCM call ourselves The Magazine for Professional Computing Management, you shouldn't get the idea that we're no fun.

We cover five of the most exciting computers on the market, as well as the most productive — the highly popular Model 100; a brand new portable, the Tandy 200; and Tandy's new MS-DOS computers, the Tandy 2000, Tandy 1200 and Tandy 1000.

We learned from THE RAINBOW that readers want programs to type in, so, each month we bring you an assortment of them, including games, utilities, business applications and graphics.

Also, PCM is the only computer publication anywhere in the world (that we know of) that brings you programs in bar code, ready to scan into memory with the sweep of a wand!

Add to this our regular tutorials on MS-DOS and dBASE, and monthly columns on telecommunicating, hardware and machine language, as well as BASIC programming tips and product reviews, and we think you'll find we're one of the most informative and

fun magazines on the market today.

So, why not join us . . . just for the fun of it? You'll receive 12 issues for \$28. Send your check or money order to: **PCM**

P.O. Box 385 Prospect, KY 40059

Please include your Visa, MasterCard or American Express number and expiration date if you wish to charge it. Sorry, we do not bill.

*Canadian subscribers add U.S. \$7. Surface rate elsewhere U.S. \$64. Air mail U.S. \$85. Allow 5-6 weeks for first copy. KY residents add 5% sales tax.

	ease send me a one year (12 issues) to PCM for only \$28.* A savings of 22% stand price.
Name	
Charge my sub	scription to my: VISA, MC, AE card
Acat #	Interbank # (MC only)
ACCI. #	

*Canadian subscribers add U.S. \$7. Surface rate elsewhere U.S. \$64. Air mail U.S. \$85. Allow 5-6 weeks for first copy.

FINANCE Stock Index will make CoCo a useful investment tool so you can have your own . . . **Barometer On**



The Stock Market

By Patrick H. Lowrie, Jr.

ou can gauge your own performance in the stock market with Stock Index. It works equally well for measuring the performance of mutual funds, bonds or anything where the price fluctuates with time.

Measuring your performance is easy if you just buy some shares and hold them. The price of the stock times the number of shares you hold tells you whether you've made money or lost it.

But, when you buy a few shares of this stock today, a few more shares in another stock in a couple of weeks or months, then sell some shares after another month or so, how can you tell? With some stocks increasing while others are decreasing, determining the net performance can be a chore.

Stock Index will take the work out of it. It doesn't care whether you're buying or selling, or whether you're reinvesting the dividends or taking them in cash. It will faithfully show you not only how you are doing, but it can show how well you would be doing if you had invested differently, or how any group of stocks, bonds, funds, etc., are doing.

It's very important to note here that you don't have to actually buy stock to use this program. On the contrary, this program provides an ideal tool by which you can experiment with hypothetical purchases and sales to evaluate an investment method before you spend any money!

Running the Program

Once the program is loaded, run it.

(Patrick Lowrie, president of Lowrie Information Systems, Inc., holds a bachelor's degree with special honors in electrical engineering. He has been writing programs professionally and for fun since 1960.)

To pass the title, press any key. If you answer 'N' to the query about the printer, the program disables the PRINT commands so you can't inadvertently request a PRINT (which would cause the program to lock up without a printer attached).

Amount Invested

After you have entered the date, the program will prompt "total investment?". Enter the total net amount you have actually (or hypothetically) spent in purchases of shares as of that date. (If you don't know this number, or if you want to just compare stocks, for instance, against a baseline date, see "Determination of Baseline" below.)

If you want to know precisely how your investments are doing, this number should include broker's fees, cost of wiring the money or cost of the certified check, and any other costs immediately associated with the purchase. If your purchase was for less than \$1,000, it's more important to include these costs, as they are a larger percentage of the total investment than for larger investments. They are real, however, so to ignore them is to make the picture look (somewhat) rosier than it really is.

If you have sold shares, reduce the total amount invested by the amount of cash you received from the sale (and be sure to reduce the NO. SHARES by the number sold).

Dividends Taken in Cash

Next, the program will prompt "Total dividends taken in cash?". As any dividends you have taken in cash are part of the return on your investment, entering this value will allow the program to more accurately compute your performance. (Any dividends that you have reinvested will increase the number of shares of the stock in question, and should be included in the NO. SHARES.)

Table of Entries

Next, the program displays a table of three columns. The first column is for entry of the identifier of the stock, fund, bond, etc. This identifier may be up to eight characters long. An example might be FDM or FREEDOM for a mutual fund named "freedom," or GMC or GENMOTOR for General Motors Corporation.

If you have several different stocks or funds, a list of names and their abbreviations is handy. Press ENTER after entering the name.

The NO. SHARES column is for the number of shares you own (or owned) of that stock or fund on this date. If your investments are in mutual or money market funds, this number should be carried out to three decimal places, for example: 34.567. Press ENTER after entering the number. The cursor automatically moves to the next column.

PRICE is the price per share on this date. Your broker (if you have one) can tell you this price, or you can get it out of the newspaper for this date. It must be entered as a decimal rather than as a fraction, and may be carried out to two decimal places. This corresponds to how the prices are listed today in most newspapers, though they are usually quoted in fractions over the air.

This process is repeated for each stock you own or are analyzing. You may list up to 12 entries. But, what if you have more entries than 12?

This program will let you list as many entries as you wish (I'll explain how a bit later), but they must be in blocks no greater than 12 entries long. When all (or 12) stocks have been listed, press ENTER in the "Stock" column of the next row. If you have listed 12 entries, the correction phase will be automatically entered.

Corrections

The entries will now be relisted on the screen followed by the words CORRECTIONS? (Y/N). If you made a mistake during the entry of the stocks, now is the time you can fix it. In response to your pressing 'Y', the program will prompt ENTER NO. OF LINE TO BE CHANGED. This number must be followed by ENTER.

You can also add stocks by selecting a number higher than those listed. (If you enter a number greater than 12, the program will announce "improper entry," and request "Correction?" again.) That is, if three stocks are listed, you can add another stock by selecting a number larger than '3'. The program will always list the next entry with the next successive number, so, if at the end of a three row entry, you entered a '5', the program would enter a '4' because that is the next number in the series.

"Stock Index doesn't care whether you're buying or selling, or whether you're reinvesting the dividends or taking them in cash. It will faithfully show you not only how you are doing, but it can show how well you would be doing if you had invested differently . . . "

You can also delete a stock by pressing ENTER without any entry in the "Stock" column of the row to be deleted. Following each correction the program will relist all entries followed by CORRECTIONS? (Y/N). You will stay in the correcting mode until you respond to the "Corrections?" prompt with 'N'.

Results

When you have completed the corrections, the program will print the results of the calculation on the screen. The screen will first list the date of this analysis, then the amount invested, dividends taken, and a table of all entries with the value of each entry noted in the right-hand column.

If the total number of entries exceeds six, the program will state at the bottom of the screen PRESS ENTER TO CONTINUE. Pressing ENTER brings up the rest of the data.

At the bottom of the table you will note a row entitled AGG 1. "AGG" stands for aggregate. This row is the one row equivalent to all the other entries. This is the feature of the program that lets you analyze as many

investment units as you wish. Before I explain how, note below the AGG 1 row the "total value" of the entries listed, and below that the "Index."

Index

The Index is what this program is all about. If you haven't made or lost a penny, the Index will be 100.00. This means you still have 100 percent of your investment.

If you have made money, the Index will be greater than 100, and the Total Value of your entries may be greater than the amount invested.

Please note, though, if you have taken appreciable dividends in cash, the "total value" number can be smaller than the "invested to date," while the Index is greater than 100. This is because the program includes these dividends in its calculation of the Index, but they do not show up in the values of the investments listed. Nevertheless, if the Index is greater than 100.00, you have made money.

The Index will not be below 100.00 until the value of all your entries plus dividends taken are less than the total amount invested.

Printout

If you answered 'Y' to the "printer connected?" prompt, you will see at the bottom of the screen PRINTOUT (Y/N)?. A 'Y' response to this prompt will result in a dump of the entire table to the printer. Since the printer is not limited by screen size, the complete (up to 12) entries are printed on one table.

Additional Entries

If you answered 'N' to the "printer connected?" prompt, or if you answer 'N' to the "printout?" prompt or at the completion of the printout, the prompt MORE STOCKS? will appear at the bottom of the screen with the (Y/N) flashing

If you respond with 'Y', the program returns to the stock entry table, but it first enters the AGG I row to this new table as entry #1. This includes the total aggregate entries of the first table as the first entry of this new table. As a consequence, the results of these new entries will include the results of the previous entries as well.

By answering 'Y' to the "more stocks" prompt, you can build your total analysis to include as many entries as you choose. Each time a new AGG is calculated, the AGG identifier will increase by one (the first will be AGG

1, the second will be AGG 2 and so on).

Answering 'N' to the "more stocks" prompt will return you to the "entry date" prompt for entry of a new and independent set of data.

Determination of Baseline

You may select any analysis as your baseline by entering '0' in answer to the "total investment" prompt. Doing this will cause the "Total Value" amount in the results table to be the baseline from which subsequent analyses can be based. It becomes 100 percent no matter what value it has. This is a convenient way to determine the performance of a block of stocks, funds, etc., for a

period of time following a specific date. Once the baseline value is established, it becomes the value used as the "Total Investment" for future analyses.

Final Note

If you want to go back into the program without losing the data, press BREAK to exit the program, then key in GOTO 300 and enter. The program will then display the last list of data entered with CORRECTIONS? (Y/N) at the bottom of the screen, and you are back in the "corrections" phase.

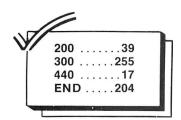
Note, however, that in order to change the amount invested or dividends taken in cash, you must either respond with 'N' to the "more stocks?" prompt,

or break and rerun the program. In either case, all previous data are erased.

Author's Comment

An enhanced version of *Stock Index* is one item on the menu of investment programs for the serious investor that is soon to be published. These programs are intended to make the CoCo a truly useful investment tool. For additional information about these programs, and for information about a pre-publication offer, write to the following address: Lowrie Information Services, Inc., 17 Lowrie Circle, P.O. Box 0728, Hialeah, FL 33011, phone (305) 557-6651.

Copyright (c) Lowrie Information Services, Inc. 1984



The listing:

50 'STOCK INDEX JUNE 24,1984 100 CLS:PRINT@133,"\$\$\$\$\$\$\$\$\$\$\$\$ \$\\$\\$\\$\\$\\$\":PRINT@165,"\\$ \\$":PRINT@197,"\\$ S TOCK \\$":PRINT@229,"\\$ \\$":PRINT@261,"\\$ INDEX \\$":PRINT@293,"\\$ \\$":PRINT@325."\\$

\$ 110 PRINT@416,"COPYRIGHT (C) LOW RIE INFORMATION SERVICES, IN

MUL- -SCREEN



COLOR CHARACTER GENERATOR





- \bullet Now includes a character generator and sample graphic space game at no extra cost.
- Full 224 text and graphic characters. Underline in all PMODES.
 Prints vertically.
- All machine language, user transparent, Supports all BASIC, EXTENDED BASIC and DISK commands.
- Automatic loader recognizes 16k, 32k & 64k computers.
- Mix up to 5 character sizes in 4 colors all on one screen. A total of 10 sizes available from 8*4 to 42*24 or 32*32 in vertical mode.
- Use up to 4 defineable window screens of any size. Also includes horizontally scrolling (crawling) one line screens.
- Includes positive & negative screen dumps in 2 sizes for R/S,
 Epson & Gemini printers. (Please specify)
- Special Trace Delay can be used to debug programs one line at a time (even graphics).
- •A special printer control can output characters to the screen & printer simultaneously.
- A must for all color computer owners. Once you try it you won't write another program without it.

(519) 681-0133

P.O. BOX 323 STATION B LONDON ONTARIO CANADA N6A 4W1 P.O. BOX 7281 PORT HURON MICHIGAN 48301 U.S.A.

MINIMUM REQUIREMENT TAPE - 24.95 US or DISK - 27.95 US or 16K BASIC 29.95 CDN 32.95 CDN

VISA

MasterCard

Tape to Disk upgrade available for \$8US or \$10CDN. We pay postage within US & CANADA on orders over \$20, otherwise please add \$1. Other countries please add \$2. Charge orders please add \$1.

ALL RIGHTS R ELSE IX=TV/DV C. 1984. 370 CLS:HP=0:G=1:Z=0:MS=0:FORX=1 ESERVED" 120 F\$=INKEY\$: IF F\$=""THEN120 TOT1: MS=MS+NS(X): NEXTX 380 PRINT#-HP,USING"FOR % 130 DIMS\$(13):DIMNS(13):DIMP(13) ":M\$:PRINT#-HP.USING"INVESTED TO :DIMTP(13):DIMK(13):DIML(13):DIM DATE: \$##### ##"; TD: FRINT#-HP.U M(13)140 CLS: PRINT@195, "PRINTER CONNE SING"DIVIDENDS TAKEN : \$######### ";DC:PRINT#-HP:PRINT#-HP,"STOCK CTED? (Y/N)" 150 Qs=INKEYs:IFQs<>"Y" ANDQs<>" PRICE VALUE": PRINT N" THEN150 ELSE IFQ\$="Y" THEN PP #-HF' .. " SHARES (\$) =1 ELSE PP=Ø (李) 180 FORX=1T013:S\$(X)="":NS(X)=0: 390 IFNS(G)=0 AND P(G)=0 THEN 44 P(X)=0:NEXTX:CLS:PRINT"****STOCK 400 FORX=G TO T1 INDEX CALCULATOR**** 410 PRINT#-HP.USING"% % ### 190 LINEINPUT"ENTRY DATE MO/DA/Y #.### ###.## #####.";S\$(X),NS(X) R ":M\$:PRINTUSING"TOTAL INVESTME P(X), TP(X): Z=Z+1NT ON % ""; M\$: INPUT TD: INPU 420 IFHP=0 AND Z=6THENG=X+1:Z=0: T"TOTAL DIVIDENDS TAKEN IN CASH"; DC INPUT"PRESS (ENTER) TO CONTINUE" 200 DV=TD/100 : H: CLS: GOTO380 210 T1=0:G=0:AG=0:V=0 430 NEXTX 440 A\$="AGG": B\$=STR\$(AG+1): A\$=A\$ 220 CLS:PRINT@6, "STOCK NO. PRICE/":PRINT@46, "SHARES SHA +B\$:PZ=(TV-DC)/MS:PRINT#-HP.USIN RE" % ####.### ###.## ##### 230 IF AG>0 THEN PRINT@64,USING" ."; A\$ MS PZ TV-DC 450 IF TD=0THEN PRINT#-HP, USING" % ###.### ###.##";A \$###### . "; TV-\$,MS,PZ BASELINE IS 240 FORX=(G+1) TO 12:K(X)=34+32* DC ELSE PRINT#-HP, USING "TOTAL VA (X-G+V):L(X)=44+32*(X-G+V):M(X)=\$###### . " ; TV-DC 53+32*(X-G+V):PRINT@(32+32*(X-G+ 460 PRINT#-HP.USING" V)), USING"##"; X; :PRINT@K(X), ""; : INDEX= #########IX INPUTS\$(X): IFS\$(X)=""THEN 260 EL 470 IF HP=0 AND PP=1THEN PRINT" SE PRINT@L(X),"";:INPUTNS(X):PRI ****PRINTOUT (Y/N)?***** ELS NT@M(X),""::INPUTP(X):T1=T1+1 480 Q\$=INKEY\$:IFQ\$<>"Y"ANDQ\$<>"N 250 NEXTX 260 PRINT@448, "CORRECTIONS? (Y/N "THEN480 ELSE 500) " 490 Q\$=INKEY\$:IFQ\$="" THEN 490 E 270 Q\$=INKEY\$:IFQ\$<>"Y" AND Q\$<> LSE 540 "N" THEN270 ELSE IFQ = "Y" THEN28 500 IFQ\$="Y"THEN HP=2:PRINT#-2," ******* : G=1:GOTO380 EL 0 ELSE 320 280 PRINT"ENTER NO OF LINE TO BE SE 540 510 CLS:PRINT"NO. CHANGED": INPUTZ: IFZ>12 THEN PRI STK NO NT@384,"IMPROPER ENTRY":PRINT@41 PRICE": PRINT" ":FORT=1T0350:NEXTT:GOT03 SHARES /SHARE 00 ELSE IF Z>T1 THENZ=T1+1:IFZ>1 520 FORX=1TOT1 2THEN Z=Z-1 ELSE T1=T1+1 530 PRINTUSING"## % ### 290 GOSUB510:PRINT@(34+32*Z),""; \$###.##"; X,S\$(X),NS(X),P(X . ### :INPUTS\$(Z):IFS\$(Z)=""THEN 310 E) : NEXTX : RETURN 540 PRINT@448,"MORE STOCKS? (Y/ LSE PRINT@(44+32*Z),"";:INPUTNS(Z):PRINT@(54+32*Z),""::INPUTP(Z)) ": FORT=1T0150: NEXTT: PRINT@448," 300 GOSUB510:GOTO260 MORE STOCKS? (/N)":FORT=1T0150: NEXTT: Q\$=INKEY\$: IFQ\$<>"Y" AND Q\$ 310 FORX=Z TO T1:S*(X)=S*(X+1):N<>"N" THEN 540 S(X)=NS(X+1):P(X)=P(X+1):NEXTX:T1=T1-1:GOSUB510:GOTO260 550 IFQ\$="Y" THEN 560 ELSE 180 320 TV=0 560 FORX=1TO T1:S\$(X)="":NS(X)=0 350 FORY=1TOT1:TP(Y)=NS(Y)*P(Y): :P(X)=0:NEXTX TV=TV+TP(Y): NEXTY 580 S\$(1)=A\$:NS(1)=MS:P(1)=PZ:G= 360 TV=TV+DC:IFTD=0 THEN IX=100 1: T1=1: AG=AG+1: V=1: GOTO220

Computing Interest Payments

A lesson on how to formulate math solutions

By Steve Blyn Rainbow Contributing Editor

he most difficult type of math example for many students is often the verbal problem. These are problems that tell a short story and ask a question, and the student must decide how the information given can lead to a solution. Many times, the solutions are not obvious; these solutions become obvious only after much explanation and practice.

It is not usually the math of these examples that thwarts students. The difficulty is in deciding how to solve the problem. The information must be internally processed in a meaningful manner. The child reaches the point where the solution becomes some arithmetic function of the pieces of given information.

There is a unique formula that accompanies each of these types of examples. When the formula is familiar, it is a matter of plugging the numbers in the right places and performing the

(Steve Blyn teaches both exceptional and gifted children, holds two master's degrees and has won awards for the design of programs to aid the handicapped. He and his wife, Cheryl, own Computer Island.)

arithmetic. This is sometimes easier said than done when the child reaches the high school level. It is wise to build a solid foundation early on to make the road ahead a little less painful.

Verbal problems come in an almost endless variety. Among them are distance, mixture, coinage, age, perimeter and interest problems. Each has its own distinctive method of obtaining the solution. Distance problems, for example, use variations of the formula Rate times Time equals Distance.

This article deals with interest exam-

"It is not usually the math of these examples that thwarts students. The difficulty is in deciding how to solve the problem."

ples: One borrows a certain amount of money at a fixed rate of interest for a given amount of time. The problem is to compute the amount of interest that will be charged. The method for computing the amount of interest owed, therefore, is based on the principal, the rate and the duration of time the money is borrowed.

Almost all of us have borrowed money for one reason or another. Mortgages, car loans and even charge cards are forms of lending. Small amounts may be borrowed for a period of a year, however, large amounts are usually borrowed for a period of years. It should therefore be explained to the children that the rate of interest is per year and that amount must be paid for each year of the loan.

Our program will teach the following formula to compute the total amount of interest owed — Interest equals Principal times Rate times Time (I = P x R x T). We will have a random person (R) borrow a random sum of money (A3) for a random amount of time (M) at a random rate of interest (B3).

These random features can be customized to your specifications as easily as ours. Line 80 chooses any one of six names to be the borrower in each example. It would probably be a better program for your needs if you change the names to those that are familiar to your child or students. Making a program personal always adds a nice friendly quality to it.

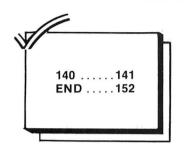
Line 100 determines the limit of the principal. A middle level of difficulty

was chosen here which you can adjust any way you wish. Line 110 determines the number of years of the loan, and Line 120 determines the rate.

The remainder of the program asks for an answer and compares it to the real answer. Right or wrong is indicated and the correct answer is displayed if an incorrect answer is given. If incorrect, the formula is also given as a gentle reminder.

A report card is given after 10

examples. The student may either end the program at this time or do another round. We hope this program helps clarify an important, yet often confusing, concept for your children.



The listing:

10 REM"COMPUTING THE INTEREST - VERBAL PROBLEMS"

20 REM"STEVE BLYN, COMPUTER ISLAN D,NY,1985

30 CT=0:CR=0:V=RND(-TIMER):REM
"CT=THE COUNTER AND CR=THE # OF
CORRECT EXAMPLES"

40 CLS5:PRINT@7,"INTEREST EXAMPLES";

50 PRINT@27,CT+1;

Aurora Computing

49 Brookland Ave., Aurora, Ontario Canada L4G 2H6

FAMILY GAMES

The popular STOCKBROKER and CRIBBAGE 32K

From BRANTEX, PIRATE TREASURE 16K \$13.95

EDUCATIONAL GAMES

Also from **BRANTEX**

BUSINESS: HOUSEHOLD EXPENSE MANAGER 16K\$19.95

LOAN ANALYSIS 16K \$20.95

NEW from MARK DATA

The amazing **TIME FIGHTER 16K** \$24.95(C) 32K \$27.95(D)

Also the ever popular **GLAXXONS 16K** \$24.95(C) 32K \$27.95(D)

UTILITIES: ROMDISK: Run your rom pack games from a disk!

MR. COPY - make up to 99 copies of one program at once!

60 CT=CT+1:IF CT=11 THEN 270 70 R=RND(6)

80 IF R=1THENA3\$=" MRS. JONES" ELSE IF R=2THEN A3\$=" MS. SMITH " ELSE IF R=3 THENA3\$=" MR. HYD E" ELSE IF R=4 THENA3\$=" DR. JE KYL"ELSE IF R=5 THEN A3\$=" MR. GRAY"ELSE A3\$=" MS. HUNTER"

90 P\$="interest=principalXrateXt

100 A3=RND(200)*10: 'THE AMOUNT

110 M=RND(5): 'THE TIME

120 B3=RND(5)+10: THE RATE OF IN TEREST

130 PRINT@128,A3\$" BORROWED \$";A 3:PRINT" AT ";B3;"% A YEAR FOR "M"YEAR";

140 IF M>1 THEN PRINT"S" ELSE PRINT" "

150 PRINT@256," ":PRINT@224,"

WHAT IS THE TOTAL AMOUNT

OF INTEREST PAID? \$ ";:LINE INPU T J\$

160 PRINTSTRING\$ (64,207);

170 J=VAL(J*): 'PLAYER'S GUESS

180 H=A3*B3*M*.01:'CORRECT ANSWER

190 IF STR\$(J)=STR\$(H) THEN PRIN T@393,"CORRECT !";:CR=CR+1:SOUND 240,3:GOTO230

200 IF STR\$(J)<>STR\$(H) THEN PRI NT" THE ANSWER IS ";:PRINTUSING" \$###.##";H;:PRINT" BECAUSE"

210 PRINT" \$"A3;"X"B3*.01;"X";M ;"= ";:PRINTUSING"\$###.##";H

220 SOUND15,5:PRINT@66,P\$;

230 PRINT@485,"press enter to go on":

240 A*=INKEY*

250 IF A*=CHR*(13) THEN 40

260 GOTO 240

270 CLS4:FORT=250T030STEP10:SOUN DT,1:NEXTT:PRINT@41,"report car d":

280 PRINT@134,"YOUR GRADE IS"CR*
10"%";

290 PRINT@352,"PRESS 'G' TO GO O N OR 'E' TO END"; 300 B\$=INKEY\$

310 IF B≸="G" THEN RUN ELSE IF B \$="E" THEN END ELSE 300 €

'HOME COMMANDER'

\$59.95





CONTROL YOUR WORLD

Give yourself piece of mind while on vacation by programming the HOME COMMANDER to control lamps, radios, TVs and more. Or make life easy on yourself by turning on the coffee pot before you wake up. You can do this and more with the HOME COMMANDER.

NO WIRES NECESSARY

The HOME COMMANDER uses your home's existing electrical wiring to control virtually anything. Appliances are controlled via small control modules (sold separately). The LAMP DIMMER MODULE allows you to turn a lamp on or off and control 16 brightness levels. The APPLIANCE MODULE is used to control appliances up to 400 watts such as a TV, radio, stereo system, fan or motor.



ON FRIDAY 7:42 PM, OFF SUNDAY 1:26 AM

Included FREE is a program to allow you to control up to 256 devices and specify the time and date they are to be activated. That's right, the software has its own built in accurate clock.

LAMP DIMMER MODULE \$16.95 APPLIANCE MODULE \$16.95

NEW! PRECISION TIME MODULE \$59.95



Now your computer will always know the correct time and date. This amazing precision time module is calibrated to the National Bureau of Standards (WWV) atomic clock and you should never have to change it.

Use the PRECISION TIME MODULE to add the time element to your games or use on BBS. If you like, purchase separately our BBS.

COLORAMA (64 K, 1 drive minimum) \$89.95

BATTERY BACKUP

Even when your computer is off, the clock keeps correct time by operating using the internal battery backup system. THE TIMEPIECE TOLORAMA COLORAMA SUPER VOICE, SUPER VOICE, SUPER VOICE, SUPER VOICE, SPEECH & SOUND PAK

MONTHS, LEAP YEARS & DST

The PRECISON TIME MODULE automatically adjusts for the different number of days in each month as well as leap years. And believe it or not, it adjusts for DST so you don't have to remember if it's SPRING FORWARD or FALL FORWARD.



Y-CABLE \$28.95

Why pay \$100 to \$200 for a multi-pak. With the Y-CABLE, you can connect your disk system to your computer along with either our STEREO PAK music synthesizer, our VOICE, SUPER VOICE speech synthesizers, or our PRECISION TIME MODULE. All connectors gold plated.



Need an

SC-01?

\$29.00



LEW ATTENTION EXPERIMENTERS!

Interested in building your own project? Our oversized board gives plenty of room for construction while the sturdy aluminum case with black satin finish assures protection and a professional appearance.

Prototype Board only \$19.95 Prototype Enclosure only \$19.95 Buy both for \$29.95 Advanced Speech Chip SSI-263 (SC-02) \$34.95

Disks (any quantity)	\$1.49
Tape C-10, C-20	\$0.69
Hard Tape Box	\$0.29
6821	\$2.95
74LS138	\$0.79
7407	
IC sockets 14, 16, 22 pin	\$0.29
IC sockets 24, 28, 40	\$0.39



VISA*



Dealer Inquiries Invited

We accept CASH, CHECK, COD, VISA and MASTER CARD orders.
Shipping and handling US and Canada \$3.00
Shipping and handling outside the US and Canada \$5.00
COD charge \$2.00
Illinois residents add 64% sales tax

Speech Systems

38W 255 DEERPATH ROAD BATAVIA, ILLINOIS 60510 (312) 879-6880 (VOICE)

1 MEGABYTE (312) 879-6811 (24 HR. BBS)

CALL ANY DAY, ANYTIME TO ORDER. ALSO ORDER BY MAIL OR BBS.

USICA

Purchase Offer Ends APRIL

available is

between

Loudness of each voice

may be individually

constantly displayed.

Voice waveshapes may be

 Tempo may be specified and may even be altered

Flats and sharps sup-

High resolution graphic

display, looks just like

voices at any point.

as the music plays.

specified.

exchanged

Memory

ported.

binations.

sheet music.

When in stereo mode, music is played through our STEREO PAK (purchased separately).



Repeat bars allow repeating of music without re-inserting music a second or third time.

 Voice timbre (waveshape) may be altered by specifying harmonic content just like stops on an organ.

During editing, voice being inserted displayed.

Each measure is numbered for easy reading of music.

Measure bars aid in reading and developing music.

Each voice may be visually highlighted for easy identification.



Billions of timbre com-

"Musica 2 is GREAT!"

Stephen Wilson

"It's the best four part harmony composer on the market and the most used program in may files." R.G. Wrights

"Of all the music programs, and I've had them all, there is no comparison in flexibility, simplicity of operation and in the warm vibrant tones that it produces. I went out and spent \$700.00 on stereo equipment just so I could more thoroughly enjoy Musica 2 and the Stereo Pak!"

Howard Lentz TCI Industries



THERE'S MORE

4 Voices produced simultaneously

Input notes from keyboard or joystick

 Play music from your own BASIC program

 Block copy music for easy music development

 100% machine language so it is lightning fast

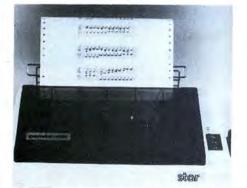
Vibrato effect easily produced

 With STEREO PAK, voices may be switched between left and right speakers as music plays

 MUSICA 2 is 100% software, no need for hardware unless you want music produced in STEREO. In that case, the STEREO PAK may be purchased separately. It's a must for the audiophile!

 Durations include: whole, half, quarter, eighth, sixteenth, thirty second, sixty-fourth, and triplet.

30 page manual describes all.



Output music to your printer (Gemini 10X, Epson, R.S. printers, Okidata).



RICH PARRY

'I THOUGHT ONLY AN APPLE SOUNDED THAT GOOD'

That's what I was told after I gave a seminar and demonstration of MUSICA 2 and the STEREO PAK at the Chicago Rainbowfest. I smiled and thanked the young man for the "supposed" compliment, but upon reflection, I became angered by the apparent belief that the CoCo is inferior in this regard. Nothing could be further from the truth.

To help fight this false belief, we've decided to lower the price of MUSICA 2 to help spread the word.

We will also keep the STEREO PAK price at \$39.95 and give you a complete refund if you are not 100% satisfied with the STEREO PAK.

NEW! STEREO PAKT

\$39.95

Plug this gem into your computer, connect to your home stereo system and sit back and enjoy music realism. The STEREO PAK is a hardware music synthesizer that plays our MUSIC LIBRARY and MUSICA 2 music in stereo. Because it was designed specifically with music reproduction in mind, the sound is superb. The highs are crisp and clear while the bass notes will rattle your walls.

The STEREO PAK is all hardware. It is intended as an enhancement for MUSICA 2 and our MUSIC LIBRARY. Disk owners may use the STEREO PAK with the R.S. Multi-Pak or our Y-CABLE (\$28.95)

New! NOW."PLAY" NOW."SOUND" AND "SOUNDS COME COMMANDS THE COMMANDS THE THRU PAK STEREO PAK Requires 64K



10 HOURS

MUSIC

NEW! MUSIC LIBRARYTM

You get over 100 four voice songs with a combined playing time of 3 hours. That's right, 3 hours of music. You won't belive your CoCo could sound so good. To fit over 100 songs required both sides of 5 C-20 tapes and the disk version uses 5 full disks (that's a half box of disks).

A JUKE BOX selection program is included to allow you to select specific songs or automatically play each. These songs are ready to go, you don't need MUSICA 2 or a knowledge of music.

These songs were developed using the best music program available for the CoCo; MUSICA 2. The tunes may be used as source files for MUSICA 2 and changed by the user. When coupled with the STEREO PAK the songs are reproduced in stereo with unsurpassed realism.

- 3 VOLUMES

MUSIC LIBRARY 100 categories:

Stage, Screen, and TV Music of the 70's Music of the 60's Music of the 50's Classical
Christmas (popular)
Christmas (traditional)
Patriotic

Old Time Favorites Polka Party

MUSIC LIBRARY 200

Our second volume of 100 tunes, 31/2 hours of music.

MUSIC LIBRARY 300

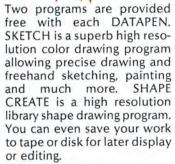
Our third volume of 100 tunes, 3 more hours of music.

MUSIC LIBRARY (Each Volume) ... (32 K Tape) ... \$34.95 (Specify 100, 200, or 300) (32 K Disk) \$39.95

FREE SOFTWARES

NEW! SPEECH SYSTEMS DATAPEN

only . . . \$29.95



The software is shipped on tape and may easily be moved to disk. Included is complete documentation to allow you to integrate the DATAPEN into your own BASIC program.





The DATAPEN is a lightpen, but unlike other light pens, it is far more sophisitcated.

- Insensitive to ambient light.
- Responds to different colors
- Program accessible LED lamp readout
- Switch for program control

WE STAND BEHIND OUR PRODUCTS

Like all our other products, if it is not the best, we won't sell it. If you're not 100% satisfied, merely return the DATAPEN for a complete refund.







Dealer Inquiries Invited

We accept CASH, CHECK, COD, VISA and MASTER CARD orders.
Shipping and handling US and Canada \$3.00
Shipping and handling outside the US and Canada \$5.00
COD charge \$2.00
Illinois residents add 64% sales tax

Speech Systems

38W 255 DEERPATH ROAD BATAVIA, ILLINOIS 60510 (312) 879-6880 (VOICE)

MEGABYTE (312) 879-6811 (24 HR. BBS)

CALL ANY DAY, ANYTIME TO ORDER, ALSO ORDER BY MAIL OR BBS.

'TALKING SOFTWARE'

FOR THE VOICE, SUPER VOICE TM, RS SPEECH & SOUND PAK

RADIO SHACK® SPEECH & SOUND TRANSLATOR

When you our any 5 of our any 5 programs X

We believe that no COCO speech synthesizer gives you the power and flexibility of the SUPER VOICE. Nevertheless, some have decided to go with the Radio Shack SPEECH & SOUND PAK. For those we've decided to open our TALKING LIBRARY by offering the SPEECH & SOUND TRANSLATOR. Just load this pro-

gram and our entire library is open to you.

But that's not all, this program adds features. You get increased intelligibility, the power of an exception table to specify specific pronunciations, \$12.81 is spoken in dollars and cents, 1,234,567 is spoken in millions, thousands, and hundreds, and much more. \$24.95

TERMTALK All the features of an intelligent telecommunications program plus what appears on the TV is spoken.

- Upload and Download programs
 Control Xmit Protocols
- Full or Split Screen
- Buffer Editing
- Normal or Reverse Video

• It talks

Please specify version (VOICE or RS SPEECH & SOUND PAK)
Tape \$39.95
Disk \$49.95

TALKING BINGO BINGO was never like this. The VOICE or SUPER VOICE makes all the calls while you sit back and play. Comes with 20 playing cards and 200 markers. High Resolution graphic screen, 3 timing level, ball count and pause control. \$24.95

ESTHER the talking psychoanalyst. An excellent example of artificial intelligence. She may not solve all your problems, but her insight will amaze you. Just like the original Eliza. \$24.95

SCORE E-Z A yahtzee type game. Up to six can play. \$24.95

ADVENTURES

CULT OF THE CAVE BEAR You're a stranded time traveler 50,000 years in the past. Can you fix your time machine while still surviving in this alien environ, and make it back? \$29.95

SHIP HUNT Play Battleship with your CoCo. All status reports are spoken. Ready battery, aim, fire at will! \$24.95

FINAL COUNTDOWN You must stop the mad general from launching a missile at Moscow and causing WW III. Has multiple voices for added realism. \$24.95

STAR TALK You're the Star Fleet Captain. Your mission...destroy the enemies' Dragon Star Ships. All status reports are spoken! \$24.95

ADVENTURE GENERATOR Create talking adventure games that are 100% Machine Language. Up to 99 rooms, 255 objects, 70 command words and 255 conditional flags.

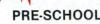
64K Disk \$39.95

EDUCATION=



ANIMATED SENTENCES The child builds complete sentences from a graphic menu using keyboard or joystick. The action is then spoken and acted out graphically. It's a great way to learn the parts of speech (ie. verb, subject, noun, etc.) \$24.95





TALKING COUNT TO ONE HUNDRED A program designed to teach the child counting to 100 by 1, 2, 5, and 10 forwards and backwards. \$29.95

TALKING ALPHABET A program designed to help the pre-schooler master the alphabet. \$29.95

TALKING NUMBERS & COLORS A must program for the very young. High Resolution graphics to insure attention and concentration. \$29.95

TALKING NUMBER SKILLS The child becomes familiar with the shape and meaning of numbers. \$29.95

TALKING CLOCK In these days of the digital clock, children miss an important education. This program aids the student in mastering the traditional analog clock. High Resolution graphics. \$29.95

TALKING SUBTRACTION A program specifically designed to help the student learn subtraction. \$29.95

KING AUTHOR'S TALES A creative writing tool to allow a child to write compositions, or short stories. Q & A option is also included. \$29.95 COLOR MATH Addition, Subtraction,

Multiplication, and Division are mastered. Student may specify difficulty level. \$24.95

SPELL-A-TRON Student builds a dictionary of words to be quizzed on.
Perfect for Spelling B. \$24.95
SPELLING TESTER A graphic spelling

game. The student is shown objects to

be spelled. \$9.95

POETRY CREATOR The VOICE speech unit is used to speak poetry that is created. \$9.95

SHORT STORY MAKER A program to create and speak stories created by the child.

\$9.95

FOREIGN LANGUAGE Learn a foreign language. French dictionary is included. \$9.95

PRESIDENTS The student is able to master the Presidents of the US. \$9.95 STATES A program designed to aid the student in learning correct spelling of the states. \$9.95

CAPITALS Learning the State's Capitals is made more interesting using speech. \$9.95

HANGMAN A word guessing game. You must guess the word before you hang. \$9.95

MATH DRILL A program to help teach arithmetic. \$9.95

All software, except as noted, shipped on tape but may be moved to disk.

'SUPER VOICE'



In 1979, VOTRAX brought us the SC-01 chip which made inexpensive speech synthesis possible. Speech Systems was proud to bring the COCO community the first speech synthesizer using this miracle device.

Now Silicon Systems Inc. brings us the SSI 263 (sometimes called the SC-02). Once again Speech Systems is happy to be the first to bring you this breakthrough in speech synthesis. The SSI 263 is the most advanced speech chip available. Read "Build a Third Generation Phonetic Speech Synthesizer" in the March 84 issue of BYTE magazine for details of this amazing chip.

FREETON"
"REACTIVOUT
TO Reflexes

FREE SUPER VOICE SINGS THE STAR SPANGLED BANNER



	SUPER VOICE	BRAND X	BRAND Y	BRAND Z
Synthesizer Device	\$\$I-263	SC-01	SP-256	SC-01
Speaking Speeds	16	1	1	1
Volume Levels	16	1	1	1
Articulation Rates	8	1	1	1
Vocal Tract Filter Settings	255	1	1	1
Basic unit of Speech	64 phonemes 4 durations each	64 phonemes	64 allophones 5 pause lengths	64 phonemes
Pitch Variations	4096 (32 absolute levels with 8 inflection speeds)	4	1	4

SUPER VOICE SONGBOOK VOL. 1

SUPER VOICE sings many of your favorite songs. Start your singing library today! ONLY ...\$24.95

COCO'S MOST ADVANCED SPEECH SYNTHESIZER.

NOW IT TALKS, SINGS AND MORE. only . . . \$79.95

The SUPER VOICE gives you COCO's most intelligible speech. The free TRANSLATOR text-to-speech program makes writing your own talking BASIC program as easy as SAY HELLO. Highest quality speech may be achieved by specifying inflection, intonation, articulation, and filtration. But that's not all, the SUPER VOICE can actually sing over a 6 octave range, play music and sound effects.





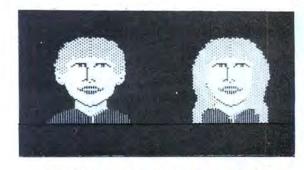






SUPER SYNTHER

SUPER SYNTHER allows you to use the SUPER VOICE as a music synthesizer. You can actually play the SUPER VOICE from your COCO keyboard as you would a piano. Vary the PITCH, FILTRATION, SOUND (Phoneme), and VOLUME to develop many unique sounds. \$24.95



SUPER TALKING HEADS



Two heads are better than one.

When the SUPER VOICE speaks in a low pitched voice, the man speaks, when a high pitched voice is used the woman speaks.

(see special offer)

Radio Shack® SPEECH & SOUND PAK version

\$24.95







Dealer Inquiries Invited

We accept CASH, CHECK, COD, VISA and MASTER CARD orders.
Shipping and handling US and Canada \$3.00
Shipping and handling outside the US and Canada \$5.00
COD charge \$2.00
Illinois residents add 64% sales tax

Speech Systems

38W 255 DEERPATH ROAD BATAVIA, ILLINOIS 60510 (312) 879-6880 (VOICE) 1 MEGABYTE (312) 879-6811 (24 HR. BBS)

CALL ANY DAY, ANYTIME TO ORDER. ALSO ORDER BY MAIL OR BBS.

Is our advanced technology serving as a catalyst for illiteracy?

Reading vs. Computers

By Michael Plog, Ph.D. Rainbow Contributing Editor

Is there a problem with literacy in this country? I have read that at least 23 million adults are functionally illiterate, and that number is reportedly growing each year. I do not know how "functionally" is being defined, but for the sake of argument, we can accept the figure, or at least the idea that a lot of people cannot read.

It has also been reported that book reading for people under 21 years of age has declined 13 percent in the last five years. So, even if people can read, they choose not to.

National studies have addressed the problem of students not being able to read in school, and even teachers who cannot read. It does seem that this country should have the highest literacy rate in the world, and we should ideally have a literacy rate over 99 percent.

(Michael Plog received his Ph.D. degree from the University of Illinois. He has taught social studies in high school, worked in a central office of a school district, and currently is employed at the Illinois State Board of Education.) Recently, I overheard someone talking about students' low level of reading, and reasoning that technology is the cause of lack of ability to read. With computers, areade games and video performances, the argument goes, students do not take the time nor have the desire to read. The lure of the television screen, with its computer generated graphics, is too much competition for books or magazines.

I disagree with this position. There has always been competition with books, including such things as fishing, cloud watching, tree climbing or just plain "hanging around." If we as a nation do not read, the fault lies not in our electronic gadgets, but in ourselves. (My apologies to Shakespeare.)

Current technology may impose many ills upon society, but a lack of reading is not one of them. We may lose our privacy, our dignity and even our definition of "good" taste, but technology will not cause us to lose our ability to read.

Now the microcomputer is but one component of current technology. It, however, is more often accused of causing a lack of reading than some of the other technologies, such as video recorders. It is my contention that current technology (including the microcomputer) will help eliminate illiteracy. It is gratifying to know that others, in positions of prestige and power, share this view.

Last year, Congress requested a study on the future of books, given the electronic methods of access to information. The Library of Congress recently released a report responding to the request.

It is true that technological expansion has "deprived the printed word of its traditional monopoly on access to knowledge, information, and the masterpieces of civilization," according to the study. Losing the monopoly, however, does not mean people have less access to knowledge.

The report goes on to explain that new technologies expand access to the world of books. For example, many classical pieces of literature are currently being reformatted to movie or television productions. These "translations" draw more people to libraries and bookstores to read the original works.

In a more direct sense, the conversion of books and newspapers to microfilm increases the availability of sources of information; sources that are being used by the American public. Computers, naturally, are used to compile and store more comprehensive reference works, and greater detail of information, than ever before.

The report claims that far from being a threat to the printed word, new information technologies promise to aid in the spread of knowledge and the war on illiteracy. In fact, the "culture of the book" benefits from the development of computers, television and even radio.

So, back to the original thought for a moment. On first glance, it may indeed appear that students are not reading as much as in the past, because they have entertainment in their home microcomputers. That position is a simple response to a problem, and does not even stand up against "common sense" arguments.

In order to operate a computer, even a relatively inexpensive, but high powered machine like the Color Computer, a person has to read directions. Also, computers tend to be in affluent homes more than in poor homes, and students from affluent backgrounds usually tend to read better than their peers of lesser economic means.

And, anyone who has had a computer more than three weeks knows that the machine does not reduce paperwork, simply processes paper more quickly. Producers of all that paper have to be able to read it.

It may be true that students today

do not read as well as in past generations. However, it may not be true, for several reasons. The most simple explanation for the lack of truth of this assertion is in the numbers and types of students taking tests now, compared with students taking tests 20 years ago.

It used to be that only college-bound students were administered the nation-wide testing for college admission. Then, the trend changed to testing almost all students — which could be done easily because of computers. By adding the lower academic students to the group taking tests, the scores have to decline. If scores of less academic students are included in national results, the average (mean) must decrease. In fact, I understand some principals have improved their school scores dramatically by only having selected students take the tests.

In some respects, it makes no difference whether students today can read as well as their counterparts of past years. It is simply unforgivable for any student in America today to not be able to read. The solution to increased literacy is not in abandoning technology, but in using technology to open more doors for students as well as adults. In essence, just what the study from the Library of Congress found is starting to happen. Educators have a responsibility to use all available means to provide reading skills to students.

I am pleasantly surprised at the availability of computer software for education, including programs for reading. A few days ago, a person I work with asked me about educational software for the Color Computer. He

has a CoCo, mostly for his daughter's use, but had not purchased many educational programs.

We started going through THE RAIN-BOW, looking for educational software. In the first 30 pages, we found advertisements from eight companies for educational software. He quit making notes at that point, realizing the abundance of available software. This can be contrasted with just a few years ago, when almost all advertisements were for games.

So, the lack of software is no excuse for not using the computer to help students read. Neither is the argument that computers are detrimental to reading. We must use the computer and other means at hand to improve reading aptitude of students.

I realize that you read, and can probably read well. After all, THE RAINBOW is a print media, and you are reading this article if you got this far. Also, any parents reading this probably have children who can read well—they have access to computers, don't they? Your responsibility, however, does not end with your family. Universal education, as the theory works in the United States, is the job of all citizens.

For anyone interested, a copy of the report from the Library of Congress can be obtained by mailing \$2.50 to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Ask for the publication, "Books in Our Future," stock number 052-070-05978-7. If anyone wishes to write to me to share opinions, my address is 829 Evergreen, Chatham, IL 62629.

* fss * FOUR STAR SOFTWARE

GALACTIC FIGHTER

A fast-paced arcade game with great graphics and sound. CoCo at its best!

Save earth by fighting your way to Dracoz, the home world of the invaders. Fly earth's secret weapon, 'The Galactic Fighter'. Overcome alien ships, missiles and meteor showers. Try and survive the deadly laser trench.

32K, one joystick required.

CASS. \$19.95 (U.S.) DISK \$24.95 (U.S.) \$24.95 (CDN.) \$29.95 (CDN.)

Write for free catalogue Dealer enquiries welcome Overseas orders add 10%

COCO PAINT

A very advanced, easy-to-use graphics development system for a 64K, single-drive CoCo!!

- Supports: keyboard, single joystick,
- mouse or X-pad
- Mix graphics and text, using built-in or user-definable characters and textures
- Create stamps: rotate, mirror, shrink, expand or invert
- Screen dump to most common printers
- 300 1200 baud modem communications capabilites
- Plus many more excellent features

DISK \$39.95 (U.S.)

\$49.95 (CDN

P.O. BOX 730 STREETSVILLE, ONTARIO CANADA L5M 2C2

BUGS II

An adventure game with all the excitement of arcade action.

Earth is infested with intelligent killer bugs. Find your way through the maze and destroy their reactor. However, you must fight the bugs all the way!

New and improved version of the game that won the Color Computer Magazine® programming contest. 64K required.

CASS. \$19.95 (U.S.) DISK \$26.95 (U.S.) \$24.95 (CDN.) \$32.95 (CDN.)

Cheque or Money Order



Add \$2.50 shipping Ont. Residents add 7% tax

THE NEW GENERATION



COMPLETE SG-10 PRINTER SYSTEM

All the performance, features, and reliability of the **Star Micronics GEMINI-10X PLUS:**

120 CPS with true descenders.

NLO (Near Letter Quality).

2K BUFFER accessible.

HEX DUMP for Machine Language listings.

ULTRA HI bit image graphics.

20% INCREASE in throughput.

1 YEAR MICRONICS WARRANTY

Servicable at over 4000 locations.

BLUE STREAK

COMPLETE SYSTEM

NOTHING MORE TO BUY

- SG-10 PRINTER
- BLUE STREAK INTERFACE
- SUPER GEMPRINT
- TYPE SELECTION/TUTORIAL

\$29995

+ \$10 Shipping and Insurance SG-15-43995

BLUE STREAK SERIAL TO PARALLEL INTERFACE

- RUN COCO I or II to PARALLEL PRINTER
- 300, 600, 1200, 2400, 4800, 9600 SWITCHABLE BAUD RATES
- AC POWER OPTIONAL-NOT NEEDED WITH SG-10 PRINTER
- COMPLETE WITH ALL CABLES AND CONNECTORS
- 180 DAY WARRANTY



5495 SHIPPING (SPECIFY PRINTER)



SUPER GEMPRINT SCREEN DUMP PROGRAM

"Overall, **Super Gemprint** is very well-written and documented."

—Rainbow December 84 review.

BONUS! TYPE SELECTION/TUTORIAL PROGRAM FREE WITH SUPER GEMPRINT

Menu driven program for the CoCo. Teaches and shows the new user the numerous features of the SG-10.

SUPER GEMPRINT AND TYPE SELECTION/TUTORIAL PROGRAM

\$17⁹⁵

+ \$2 Shipping and Handling

DAYTON ASSOCIATES OF WALL, INC.

DUN & BRADSTREET LISTED

7201 CLAIRCREST BLDG. C • DAYTON, OHIO 45424
(513) 236-1454
OHIO RESIDENTS ADD 6% SALES TAX
C.O.D. ADD \$2.00



RAINBOW REVIEWS



Arithmetic Tutor	
A Good Practice Tool For Problem-Solving/Computer Island	207
BBS Log Book	
Can Help You Get Organized/Atmospheres	219
B-XREF	
A Good Utility For Any BASIC09 Programmer/Interactive Micro Systems	209
Bakersfield KENO	
Gamble Casino Style/Seibyte Software	216
BASIC Searcher	
Inspect Your Programs/Color Computer Utilities Unlimited	196
Cassette Box Insert Maker	
Polish Appearance Of Cassettes/The CoCo Freeware Clearinghouse	198
CoCo Cooler II	
To Help CoCo Breathe Easier/Spectrum Projects, Inc.	226
Color Stat Strategy Baseball	
An Excellent Statistical Game/Pinto Products	208
DATALIST	
A Good General Purpose Database/Computer Associates, Inc.	218
Don't Forget	
Keep A Computer Calendar/Computerware	228
Grand Prix	
Rivals Arcade Version Of Auto Race Games/Intracolor	211
LIZPAC	
An Extensive Statistical Analysis Package/Prickly-Pear Software	212
Music Library 200, Music Library 300	
Together With CoCo Make Beautiful Tunes/Speech Systems	205
Omega File	
Good Management System/The Other Guy's Software	223
PBJ 2SP-Pak	
An Excellent Unit/PBJ, Inc.	192
An Excellent Unit/PBJ, Inc. Pause Control Switch	
An Excellent Unit/PBJ, Inc.	
An Excellent Unit/PBJ, Inc. Pause Control Switch Take A Break/The Data'Phile Preschool Pak	220
An Excellent Unit/PBJ, Inc. Pause Control Switch Take A Break/The Data'Phile	220
An Excellent Unit/PBJ, Inc. Pause Control Switch Take A Break/The Data'Phile Preschool Pak Reinforces Letter And Number Recognition/Harmonycs Rembrandt	220
An Excellent Unit/PBJ, Inc. Pause Control Switch Take A Break/The Data'Phile Preschool Pak Reinforces Letter And Number Recognition/Harmonycs	220
An Excellent Unit/PBJ, Inc. Pause Control Switch Take A Break/The Data'Phile Preschool Pak Reinforces Letter And Number Recognition/Harmonycs Rembrandt Create Graphics Masterpieces/Family Computers.	220
An Excellent Unit/PBJ, Inc. Pause Control Switch Take A Break/The Data'Phile Preschool Pak Reinforces Letter And Number Recognition/Harmonycs Rembrandt Create Graphics Masterpieces/Family Computers.	220
An Excellent Unit/PBJ, Inc. Pause Control Switch Take A Break/The Data'Phile Preschool Pak Reinforces Letter And Number Recognition/Harmonycs Rembrandt Create Graphics Masterpieces/Family Computers. The Sailor Man Shiver Your Timbers/Tom Mix Software Screen+	220
An Excellent Unit/PBJ, Inc. Pause Control Switch Take A Break/The Data'Phile Preschool Pak Reinforces Letter And Number Recognition/Harmonycs Rembrandt Create Graphics Masterpieces/Family Computers. The Sailor Man Shiver Your Timbers/Tom Mix Software	220
An Excellent Unit/PBJ, Inc. Pause Control Switch Take A Break/The Data'Phile Preschool Pak Reinforces Letter And Number Recognition/Harmonycs Rembrandt Create Graphics Masterpieces/Family Computers. The Sailor Man Shiver Your Timbers/Tom Mix Software Screen+ Adds Variety To Your Text Screen/Dataman International Shrinx	220211226210206
An Excellent Unit/PBJ, Inc. Pause Control Switch Take A Break/The Data'Phile Preschool Pak Reinforces Letter And Number Recognition/Harmonycs Rembrandt Create Graphics Masterpieces/Family Computers. The Sailor Man Shiver Your Timbers/Tom Mix Software Screen+ Adds Variety To Your Text Screen/Dataman International	220211226210206
An Excellent Unit/PBJ, Inc. Pause Control Switch Take A Break/The Data'Phile Preschool Pak Reinforces Letter And Number Recognition/Harmonycs Rembrandt Create Graphics Masterpieces/Family Computers. The Sailor Man Shiver Your Timbers/Tom Mix Software Screen+ Adds Variety To Your Text Screen/Dataman International Shrinx An Exceptional Graphics Programming Tool/GRAFX TRS COPY	220 211 226 210 206
An Excellent Unit/PBJ, Inc. Pause Control Switch Take A Break/The Data'Phile Preschool Pak Reinforces Letter And Number Recognition/Harmonycs Rembrandt Create Graphics Masterpieces/Family Computers. The Sailor Man Shiver Your Timbers/Tom Mix Software Screen+ Adds Variety To Your Text Screen/Dataman International Shrinx An Exceptional Graphics Programming Tool/GRAFX	220211226210206
An Excellent Unit/PBJ, Inc. Pause Control Switch Take A Break/The Data'Phile Preschool Pak Reinforces Letter And Number Recognition/Harmonycs Rembrandt Create Graphics Masterpieces/Family Computers. The Sailor Man Shiver Your Timbers/Tom Mix Software Screen+ Adds Variety To Your Text Screen/Dataman International Shrinx An Exceptional Graphics Programming Tool/GRAFX TRS COPY Transfers Disk BASIC Text Files To OS-9 Files/Radio Shack T/S EDIT	220 211 226 210 206 221
An Excellent Unit/PBJ, Inc. Pause Control Switch Take A Break/The Data'Phile Preschool Pak Reinforces Letter And Number Recognition/Harmonycs Rembrandt Create Graphics Masterpieces/Family Computers. The Sailor Man Shiver Your Timbers/Tom Mix Software Screen+ Adds Variety To Your Text Screen/Dataman International Shrinx An Exceptional Graphics Programming Tool/GRAFX TRS COPY Transfers Disk BASIC Text Files To OS-9 Files/Radio Shack T/S EDIT Make Editing Effortless/Radio Shack	220 211 226 210 206
An Excellent Unit/PBJ, Inc. Pause Control Switch Take A Break/The Data'Phile Preschool Pak Reinforces Letter And Number Recognition/Harmonycs. Rembrandt Create Graphics Masterpieces/Family Computers. The Sailor Man Shiver Your Timbers/Tom Mix Software Screen+ Adds Variety To Your Text Screen/Dataman International Shrinx An Exceptional Graphics Programming Tool/GRAFX TRS COPY Transfers Disk BASIC Text Files To OS-9 Files/Radio Shack T/S EDIT Make Editing Effortless/Radio Shack TALKHEAD (And Real Talker Update)	220 211 226 210 206 221 222
An Excellent Unit/PBJ, Inc. Pause Control Switch Take A Break/The Data'Phile Preschool Pak Reinforces Letter And Number Recognition/Harmonycs. Rembrandt Create Graphics Masterpieces/Family Computers. The Sailor Man Shiver Your Timbers/Tom Mix Software Screen+ Adds Variety To Your Text Screen/Dataman International Shrinx An Exceptional Graphics Programming Tool/GRAFX TRS COPY Transfers Disk BASIC Text Files To OS-9 Files/Radio Shack T/S EDIT Make Editing Effortless/Radio Shack TALKHEAD (And Real Talker Update) Reveal New Dimension In Voice Synthesis/Colorware	220 211 226 210 206 221
An Excellent Unit/PBJ, Inc. Pause Control Switch Take A Break/The Data'Phile Preschool Pak Reinforces Letter And Number Recognition/Harmonycs Rembrandt Create Graphics Masterpieces/Family Computers. The Sailor Man Shiver Your Timbers/Tom Mix Software Screen+ Adds Variety To Your Text Screen/Dataman International Shrinx An Exceptional Graphics Programming Tool/GRAFX TRS COPY Transfers Disk BASIC Text Files To OS-9 Files/Radio Shack T/S EDIT Make Editing Effortless/Radio Shack TALKHEAD (And Real Talker Update) Reveal New Dimension In Voice Synthesis/Colorware Talking Shiphunt	220 211 226 210 206 221 222 222
An Excellent Unit/PBJ, Inc. Pause Control Switch Take A Break/The Data'Phile Preschool Pak Reinforces Letter And Number Recognition/Harmonycs. Rembrandt Create Graphics Masterpieces/Family Computers. The Sailor Man Shiver Your Timbers/Tom Mix Software Screen+ Adds Variety To Your Text Screen/Dataman International Shrinx An Exceptional Graphics Programming Tool/GRAFX TRS COPY Transfers Disk BASIC Text Files To OS-9 Files/Radio Shack T/S EDIT Make Editing Effortless/Radio Shack TALKHEAD (And Real Talker Update) Reveal New Dimension In Voice Synthesis/Colorware Talking Shiphunt Be A Battleship Mate/JARB Software	220 211 226 210 206 221 222
An Excellent Unit/PBJ, Inc. Pause Control Switch Take A Break/The Data'Phile Preschool Pak Reinforces Letter And Number Recognition/Harmonycs. Rembrandt Create Graphics Masterpieces/Family Computers. The Sailor Man Shiver Your Timbers/Tom Mix Software Screen+ Adds Variety To Your Text Screen/Dataman International Shrinx An Exceptional Graphics Programming Tool/GRAFX TRS COPY Transfers Disk BASIC Text Files To OS-9 Files/Radio Shack T/S EDIT Make Editing Effortless/Radio Shack TALKHEAD (And Real Talker Update) Reveal New Dimension In Voice Synthesis/Colorware Talking Shiphunt Be A Battleship Mate/JARB Software Tandy Deluxe RS-232 Pak	220 211 226 210 206 221 222 222 222
An Excellent Unit/PBJ, Inc. Pause Control Switch Take A Break/The Data'Phile Preschool Pak Reinforces Letter And Number Recognition/Harmonycs Rembrandt Create Graphics Masterpieces/Family Computers. The Sailor Man Shiver Your Timbers/Tom Mix Software Screen+ Adds Variety To Your Text Screen/Dataman International Shrinx An Exceptional Graphics Programming Tool/GRAFX TRS COPY Transfers Disk BASIC Text Files To OS-9 Files/Radio Shack T/S EDIT Make Editing Effortless/Radio Shack TALKHEAD (And Real Talker Update) Reveal New Dimension In Voice Synthesis/Colorware Talking Shiphunt Be A Battleship Mate/JARB Software Tandy Deluxe RS-232 Pak An Excellent Unit/Radio Shack	220 211 226 210 206 221 222 222
An Excellent Unit/PBJ, Inc. Pause Control Switch Take A Break/The Data'Phile Preschool Pak Reinforces Letter And Number Recognition/Harmonycs Rembrandt Create Graphics Masterpieces/Family Computers. The Sailor Man Shiver Your Timbers/Tom Mix Software Screen+ Adds Variety To Your Text Screen/Dataman International. Shrinx An Exceptional Graphics Programming Tool/GRAFX TRS COPY Transfers Disk BASIC Text Files To OS-9 Files/Radio Shack T/S EDIT Make Editing Effortless/Radio Shack TALKHEAD (And Real Talker Update) Reveal New Dimension In Voice Synthesis/Colorware Talking Shiphunt Be A Battleship Mate/JARB Software Tandy Deluxe RS-232 Pak An Excellent Unit/Radio Shack TEXT	220 211 226 210 206 221 222 222 200 214
An Excellent Unit/PBJ, Inc. Pause Control Switch Take A Break/The Data'Phile Preschool Pak Reinforces Letter And Number Recognition/Harmonycs Rembrandt Create Graphics Masterpieces/Family Computers. The Sailor Man Shiver Your Timbers/Tom Mix Software Screen+ Adds Variety To Your Text Screen/Dataman International Shrinx An Exceptional Graphics Programming Tool/GRAFX TRS COPY Transfers Disk BASIC Text Files To OS-9 Files/Radio Shack T/S EDIT Make Editing Effortless/Radio Shack TALKHEAD (And Real Talker Update) Reveal New Dimension In Voice Synthesis/Colorware Talking Shiphunt Be A Battleship Mate/JARB Software Tandy Deluxe RS-232 Pak An Excellent Unit/Radio Shack TEXT Teaches Valuable Lesson In Word Processing/Wish Software	220 211 226 210 206 221 222 222 200 214
An Excellent Unit/PBJ, Inc. Pause Control Switch Take A Break/The Data'Phile Preschool Pak Reinforces Letter And Number Recognition/Harmonycs. Rembrandt Create Graphics Masterpieces/Family Computers. The Sailor Man Shiver Your Timbers/Tom Mix Software Screen+ Adds Variety To Your Text Screen/Dataman International Shrinx An Exceptional Graphics Programming Tool/GRAFX TRS COPY Transfers Disk BASIC Text Files To OS-9 Files/Radio Shack T/S EDIT Make Editing Effortless/Radio Shack TALKHEAD (And Real Talker Update) Reveal New Dimension In Voice Synthesis/Colorware Talking Shiphunt Be A Battleship Mate/JARB Software Tandy Deluxe RS-232 Pak An Excellent Unit/Radio Shack TEXT Teaches Valuable Lesson In Word Processing/Wish Software 24-Pin/28-Pin EPROM Adapter	220 211 226 210 206 221 222 222 200 214 192
An Excellent Unit/PBJ, Inc. Pause Control Switch Take A Break/The Data'Phile Preschool Pak Reinforces Letter And Number Recognition/Harmonycs Rembrandt Create Graphics Masterpieces/Family Computers. The Sailor Man Shiver Your Timbers/Tom Mix Software Screen+ Adds Variety To Your Text Screen/Dataman International Shrinx An Exceptional Graphics Programming Tool/GRAFX TRS COPY Transfers Disk BASIC Text Files To OS-9 Files/Radio Shack T/S EDIT Make Editing Effortless/Radio Shack TALKHEAD (And Real Talker Update) Reveal New Dimension In Voice Synthesis/Colorware Talking Shiphunt Be A Battleship Mate/JARB Software Tandy Deluxe RS-232 Pak An Excellent Unit/Radio Shack TEXT Teaches Valuable Lesson In Word Processing/Wish Software	220 211 226 210 206 221 222 222 200 214 192

DISK DRIVES

DISK DRIVES

DISK DRIVES

DISK DRIVES

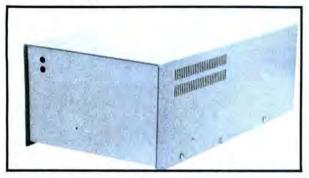
DISK DRIVES

Price Changes Occur On A Daily Basis. Please Call 1-800-343-8841



Price Changes Occur On A Daily Basis. Please Call 1-800-343-8841

Super Sale on New Hard Drives



Warranty - One Full Year

Introducing

MEGADISK™

Winchester Hard Drive ready to run on the TRS 80 Model I/III/IV/4P. Color Computer, I.B.M.-PC, Apple, Franklin, Max/80.

Software Drivers: LDOS, NewDos/80, Dosplus, TRSDOS 6.0, CP/M

DRIVE A HARD BARGAIN™ Complete Systems Starting at \$649.95

Call Toll Free Ordering 1-800-343-8841



High Quality Lowest Price Drive 0, 1, 2, 3

for the

Color Computer

Starting at \$199.95 CALL FOR NEW



Disk Drive Upgrade for Model III/IV easy to install system Starting at \$309.95 CALL FOR NEW

1 Edgell Road, Framingham, MA 01701 (617) 872-9090 Telex-383425

Hours: Mon. thru Fri. 9:30 am to 5:30 pm (E.S.T.) Sat. 10:00 am to 3:30 pm

DEALER INQUIRIES INVITED.

M.C./Visa/Amex and personal checks accepted at no extra charge. C.O.D., please add \$3.00. Shipping: Please call for amount. Not responsible for typographical errors. Prices subject to change.

CANADA MICRO R.G.S. INC

751. CARRE VICTORIA, SUITE 403 MONTREAL, QUEBEC, CANADA Regular Tel. (514) 287-1563 Canadian Toll Free 800-361-5155

Service! Service!

All in stock products are shipped within 24 hours of order. Repair/Warranty service is performed within 24 hours of receipt unless otherwise noted. We accept C.O.D., foreign and APO orders. School and D&B corporate P.O.s accepted.

TRS/80 Registered Trademark Tandy Corp. IBM-PC Registered IBM Corp.

LDOS Reg. Logical System Inc.

Apple Registered Trademark Apple Computer Corp Franklin Registered Trademark Franklin Corp. Dosplus - Micro Systems Software

Max/80 Registered Trademark Lobo Int.

Newdos/80 - Apparat Inc.

DISK DEINES

DISK DEINES

DISK DBIAES

DISK DRIVES

DISK DRIVES

DISK DRIVES

DISK DBIAES

Prices Change Every Day. Please Call 1-800-343-8841 For Lower Prices.



Prices Change Every Day. Please Call 1-800-343-8841 For Lower Prices.

DEREER INQUI	
MEGADISK TM HARD DISK DRIVE SYSTEMS For the IBM/PC, Tandy 1000, TRS/80 Models I/III/IV/4P, Compaq, For the Tava, PC Workalikes, Color Computers, Apple/Franklin, Heath Complete with Hardware, Cables, Software and Quikfit Installa	TOLL FREE ORDERING 1-800-343-8841 Eagle, Sanyo, 1/Zenith, Max/80
5 Megabytes Internal Mount (IBM Special) 10 Megabytes Internal Mount — Low Power — Boots Just Like An X 20 Megabytes Internal Mount 5 Megabytes External System 10 Megabytes External System (IBM Format Equals 11.2 Megabytes — 20 Megabytes External System 3.3 Megabytes Kodak Backup System Streaming Tape Backup System — Internal Or External	Starting at \$ 399.95
DOS Systems Available: {IBM/Heath — DOS, 1.0, 2.0, 2.1, 3.0, or later TRS/80-LDOS, TRSDOS 6.x, Newdos/80, Dos WARRANTIED FOR ONE FULL YEAR — PARTS AND LABOR — 24	splus 3.5, CP/M, COCO DOS, Max/80 LDOS, OS9

are Und	FLOPPY DISK DRIVES, POWER SUPPLIES AND CABINETS & Drives are UL approved — Our Floppy Drive Cabinets and Power Supplies ferwriters Laboratory Listed and have passed the required Federal mications Part 15 Section B-EMI/RF1 tests.
drive po	(y on all disk drives is one full year parts and labor. Warranty on floppy disk wer supplies is five (5) years. In warranty or out of warranty service is 24 hour ound on all disk drives and power supplies.
Tandon	- Full Height Drives
100-1	Single Sided 40 tk Bare \$128.00
	In Case with Power Supply
	Dual Drives in One Cabinet
100-2	Dual Sided 40 tk Bare
	In Case with Power Supply 209.9:
	Dual Drives in One Cabinet
	Half High Drives
65-1	Single Sided 40 1k Bare
	In Case with Power Supply
	Dual Drives in One Cabinet
65-2	Dual Sided 40 tk Bare
	In Case with Power Supply 179.9
	Dual Drives in One Cabinet
65-4	
	In Case with Power Supply
	Dual Drives in One Cabinet
	Half High Drives
55A	Single Sided 40 tk Bare
	In Case with Power Supply
	Dual Drives in One Cabinet
55B	Dual Sided 40 tk Bare 160.0
	In Case with Power Supply 199.9
	Dual Drives in One Cabinet
55F	Dual Sided 80 tk Bare
	In Case with Power Supply
	Dual Drives in One Cabinet
	ranklin Disk Drives
	40 Track in Case with Cable and Software 159.9:
	ntroller Card for Two Disk Drives
	mbination Price for Disk Drive and Controller
	dore Disk Drives
Power S	Supplies and Cabinets 51/4" and Hard Drive Systems starting at 45.0

C	OLOR COMPUTER DISK DRIVE SYSTEMS AND ADD IN PRODUC	CIS
40 Im	ck Single Head Drive with Case, Power Supply, Cable	\$269.95
40 Ira	ck Dual Head with Case, Power Supply, Cable, introller, Instruction Booklet, Diskettes	289.95
128 M	nive with Dual Drives in One Cabinet Learney Upgrade Kit DOS Switch	129.95
	ith Second DOS System — JDOS, RSDOS, Micro DOS, and Booklet	

TRS/80 HARDWARE
Model I Starter System - Delivered by UPS
One Single Sided Disk Drive, Case, Cable, Power Supply,
TRSDOS 1.3 and Manual
Model III/IV Easy to Install Disk Drive Systems
Memory Upgrades — 4116 and 4164 starting at 1.50 ea.

ALL IN-STOCK ITEMS SHIPPED WITHIN 24 HOURS. SAME DAY SHIPPING PROVIDED BY REQUEST WITHOUT ANY EXTRA HANDLING CHARGES.

COMPUTERS All of our computers come with a full one year Warranty — Parts and Labor — 24 Hour Service on all in stock parts.
* 1BM Special 10 Megabytes W/Tape Backup Mono/Print Adap. Monitor 53,59
IBM/PC-256K Two Floppy Drives, One Year Warranty
With Monitor Card and High Resolution Monitor
IBM/PC-256K 5 Megabyte Drive, One Floppy Drive
With Monitor Card and Monochrome Monitor 2,69
10 Megabyte System
With Monitor Card and Monochrome Monitor
IBM Lookalike Monitor 800h x 650v resolution w/cable 19
TRS/80 Model IV Computer 128K Dual Drive RS232
PRINTERS

2.5 8000.0	PRINTERS
Dot Matrix	
Citizen	
Star Mic	ronics
Gem	ini X-Series Parallel 120 CPS starting at \$259.95
Delta	10/15 160 CPS starting at 424.95
	x 10/15 200 CPS starting at 649.95
	sonic 1090 249.95
Daisy W	
Daisy W	Reed 440 80 Column 12 CPS
Silve	
àt.	
	pia 132 Column 14 CPS with Form and Tractor 399.95
	Micronics 100 Column 18 CPS
	klin Printer Interface w/Graphics and Cable
	les starting at 19.95
Print	er Paper - Microperf Edge 1000 Sheets

Wolksmodem 300 Baud \$ 59. Signalman Mark X Autodial 123.		The Market	_
		MODEMS	
Signalman Mark X Autodial 123.	Volksmodem 3	0 Baud S	59.9
	Signalman Ma	k X Autodial	123.5

Surge Protectors - Line Filters -

ELECTRICAL
SL Waber — 6 Outlets with Switch

٠	ADD IN BOARDS FOR THE IBM
	oppy Disk Controller
57	TB — Rio Plus 128K
	Super Rio 128K
	Graphix Plus
	Graphics Plus 11
	Parallel Printer Port
	Serial Port
vi	onochrome Board with Parallel Printer Port
)	uadram — Quadboard w/128K 269.9
•	Quadcolor 1 215.9
	Ouadcolor II

MISCELLANEOUS		
Diskettes in 10 Pack		12.95
Twoprint Switches		99.95
Disk Drive Cables		16.00
Maintenance Cleaning Kits		12.00
Parallel Printer Buffers 8K	Sec. of	149,95
Floppy Disk Drive Cables		
1 Drive		16.00
2 Drives		18.95
Heath/Zenith 2 Drive Cables — Shielded		39.95

FTWARE SUPPORT, INC.

1 Edgell Road, Framingham, MA 01701 (617) 872-9090 Telex-383425

Hours: Mon. thru Fri. 9:30 am to 5:30 pm (E.S.T.) Sat. 10 am to 3:30 pm SERVICE POLICY — Our Professional Technical Staff Is Available To Assist You Monday Through Saturday. WARRANTIES — Disk Drives — One Full Year Parts And Labor. Floppy Disk Drive Power Supplies — Five (5) Years. SERVICE — 24 Hour Turn-A-Round On All In-Stock Parts. Dealer Inquiries Invited.

Please Call For Shipping, Handling And Insurance.

Not Responsible for Typographical Errors. Prices and Specifications May Change Without Notice. Please Call For Our Latest Price Saving Specials.

RECEIVED & CERTIFIED

The following products recently have been received by THE RAINBOW, examined by our magazine staff and approved for the *Rainbow Seal of Certification*, your assurance that we have seen the product and have ascertained that it is what it purports to be. This month the *Seal of Certification* has been issued to:

Company Commander Version 1.1, a 32K squad level World War II infantry combat game for tape or disk. Game Module #1 comes with House to House map and more than 10 scenarios involving famous European city battle-grounds such as Arnheim, Tobruk and Stalingrad. Combat units include rifle squads, mortar teams, machine gun crews, engineers, leaders and other weaponry of World War II. Design allows incorporation of future expansion modules. Ark Royal Games, P.O. Box 14806, Jacksonville, FL 32238, \$29.95

Panzers East, a 32K ECB Simulation that relives the German High Command's Drive on Moscow in World War II. Despite the overwhelming forces you command you must carefully juggle your units: keeping enough at the front to drive back the Soviet army and yet garrisoning adequately captured territory to squelch partisan activity. Finally you must complete your objective before you are taught the lesson so bitterly learned by Napoleon: How cold is a Russian winter? Avalon Hill Game Company, 4517 Harford Rd., Baltimore, MD 21214, cassette \$25

Handycode, a 16K ECB encryption program to secure storage of passwords, safe combinations or any top secret such as a surprise party guest list. Key passwords are not saved at sector or bit level insuring examination by unauthorized persons will net only frustration. V. Baumann, P.O. Box 415, Hammond, IN 46325, cassette \$18.50, disk \$19.50

Quiz Kids, two 16K quiz programs requiring the Color LOGO program-pak. LOGO Shapes for younger children which allows the child to experience an interesting and instructive environment similar to running a program written in BASIC, and LOGO Stars which quizzes older children on displays of five constellations in the northern skies. B

& B Software, P.O. Box 210, Jenkintown, PA 19046, either cassette \$14.95 or both programs on one cassette \$22.50

Congress, a 32K ECB Simulation that has elected you President of the United States. You select a program to get through Congress. You decide which states to influence through pork-barrel legislation. You assign lobbyists to the House or Senate and finally you decide whether to sign a bill into law or veto it. B5 Software Co., 1024 Bainbridge Place, Columbus, OH 43228, cassette \$29.95, disk \$31.95

Recess Games, an ECB 16K cassette or 32K disk series of four games for children grades two through eight. TIC-TAC-TOE encourages children to predict and plan sequential moves; Number Guess includes an optional use of a number line which helps younger children determine the answer; Treasure Hunt which teaches use of coordinates to find treasure hidden behind a grid; Masterbrain which encourages players to consider the many possible ways to arrange specific digits to build numbers. All games are multi-leveled so children of different ages can play the same game. B5 Software Co., 1024 Bainbridge Place, Columbus, OH 43228, cassettes \$19.95, disk \$21.95

TIC-TAC-TOE, a 16K ECB version of the game offering three levels of difficulty and the choice of opponents, another person or CoCo. Moves made by either joystick or arrow keys. Draco Software, 22 Lassell Street, Portland, ME 04102, cassette \$4.95

ZOOKEY, a 32K typing tutor program with adjustable speed and skill levels to encourage beginners or challenge the experienced typist. Features include game-play action and Hi-Res graphics. Mark Data Products, 24001 Alicia Parkway, No. 207, Mission Viejo, CA 92691, cassette \$24.95, disk \$27.95

CoCo Professional Tax Preparer, a 32K program requiring two disk drives that lets CoCo take the place of your current tax preparer or accountant. After you gather all your tax information together CoCo will interview you in an organized fashion beginning with the heading information and proceeding step by step through all income, adjustments and deductions, and will then compute your tax. After the tax is computed the credits and other taxes sections will be presented for your input. Based on this input, balance owed (shudder) or refund due (sigh) will be computed. Micro Data Systems, 6 Edward Dr., Ashland, MA 01721, disks \$149.95

Color Stat, a 16K ECB data analysis system to maintain data files, calculate a wide variety of statistics, display results on screen and list results on line printer. Features include, descriptive statistics, frequency distribution, graphic histogram, correlation statistics, linear regression equation, least squares prediction, matched-pairs t test, scattergram with regression line, multiple regression with two predictors and analysis of variance for up to five groups. Radio Shack stores nationwide, cassette \$24.95

Cyrus World Class Chess, a 16K chess challenge under tournament conditions. Cyrus can play against itself or replay moves from a finished game. While pondering its moves it can show you the possibilities it is considering. You may take back moves or set up special positions for problem-solving or analysis. When instructed to play "fast" Cyrus can't "think" as long about its moves and is an ideal opponent for the beginner. Radio Shack stores nationwide, \$39.95

Professor Pressnote's Music Machine, a 32K ECB series of educational activities designed to introduce children to the fundamentals of music. Concepts include the names and locations of the notes on a musical staff, the lengths of various notes and the way notes fit together to form melodies. Radio Shack stores nationwide, cassette \$24.95

Electronic Book, that lets you put pages from various programs in. Children

touch spots on the pages to advance the program. Radio Shack stores nationwide, \$24.95

7 Card Stud, a 16K Simulation of the most popular version of the game of poker. Play against one, two or three opponents, choosing them for their playing styles. Ask CoCo for advice if you're unsure of your next move. Radio Shack stores nationwide, RomPak \$24.95

Shamus, a 16K Adventure requiring a disk drive and joystick. You're an intergalactic gumshoe and all-around tough guy armed only with the universally banned Ion-Shivs and your own smarts sent to annihilate that malevolent, murderous stinker, The Shadow. His lair is in another time space guarded by the robodroids, Whirling Drones and Snap-Jumpers. It's dangerous, it can be deadly but that's why they call you *Shamus*. Radio Shack stores nationwide, disk \$29.95

The CoCo Tuner, a precision audio tone generator and pitch comparator. Designed to be plugged into the expansion port of the CoCo or CoCo 2, it can aid in tuning a wide variety of musical instruments by providing a graphical display of the pitch of a note, or by precise pitch through the television speaker or cassette output. Features included are easy-to-use manual, singlekeystroke commands to advance notes up or down through a chromatic scale and the entire musical scale can be offset uniformly for tuning to a relative standard other than A-440. Accuracy is within .003 Hz at middle C. Real-Time Specialties, Inc., 6384 Crane Rd., Ypsilanti, MI 48197; module and manual \$89, microphone with six-inch cord \$14, piano tuning kit with wrench, mutes, felt and booklet \$27, Michigan residents add 4% sales tax

CoCo Cooler II, a handy gadget to prevent unwanted heat buildup inside your Color Computer to keep things cool and running smoothly. Specify 'D', 'E' or CoCo 2. Spectrum Projects, Inc., P.O. Box 21272, Woodhaven, NY 11421 or P.O. Box 9866, San Jose, CA 95157-0866, \$49.95 plus \$3 S/H

16K DOS Adapter, an adapter for using 2764, 27128 and 27256 EPROMs in place of your existing ROMs. Spectrum Projects, Inc., P.O. Box 21272, Woodhaven, NY 11421 or P.O. Box 9866, San Jose, CA 95157-0866, \$19.95 plus \$3 S/H

CERTIFICATION

The Seal of Certification program is open to all manufacturers of products for the TRS-80 Color Computer, the TDP-100, or the Dragon-32, regardless of whether they advertise in THE RAINBOW. By awarding a Seal, the magazine certifies the program does exist, but this does not constitute any guarantee of satisfaction. As soon as possible, these hardware or software items will be forwarded to THE RAINBOW'S reviewers for evaluation.

- Monica Dorth

SOFTWARE THAT DOES SOMETHING!

NOT SHOOT-EM-UP GAMES NOT ANOTHER LANGUAGE NOT MORE UTILITIES



ANKIA RESEARCH Software lets your Color Computer do something for you NOW!

Our PROFESSIONAL 3-D PLOTTER# will draw a "landscape" in 6 seconds! This ML program lets you generate the surface using BASIC and almost instantly your picture appears. \$24.95

Our **SPECTRUM ANALYZER**# will calculate a Fast Fourier Transform (spectrum) over 10 times faster than BASIC. **\$24.95**

Do you run a small business or a large home? **PROPRIETOR'S ACCOUNTANT** is a complete double-entry bookkeeping system. 32 K Disk Only **\$29.95**

WE'VE TAKEN THE WORK OUT OF SOLVING YOUR MATHEMATICS PROBLEMS!

Do you have a series of points that you want fit to a line or curve?

Get FUNCTION FINDER* \$12.95

Do you want to solve an equation or a

set of linear equations? You need

EQUATION EVALUATOR* \$12.95

Do you need to invert, add, and multiply matrices? MATRIX MATH* can handle a 37x37 matrix in 32 K. \$12.95

Do you need to solve a finite integral or differentiate a function?

CALCULUS* can do it. \$12.95 ALL 4 MATH PROGRAMS \$44.00

EDUCATIONAL SIMULATIONS#
STRATEGY POLITICS \$16.95

STRATEGY INVESTING \$16.95 Today's market or 1929

The 1984 Election

STRATEGY FOOTBALL \$16.95 NFL, NCAA, USFL Play-by-Play

STRATEGY BOXING \$12.95 Coach the Olympic Team

IMAGE PROCESSING \$16.95 64 x 48 Pixels with 16 gray scales ALL FIVE SIMULATIONS \$69.95

Check or money order, add \$2.00 shipping. Specify Disk or Tape, #32K or *16K Req'd. Florida Residents add 5% Sales Tax WRITE FOR FREE CATALOG



ANKIA RESEARCH

901-19 INDIANTOWN RD. SUITE R JUPITER, FL 33458

REAL TIME CLOCK

RTC-10

Full featured, yet very easy to use. RTC-10 is a quartz-based, Time/Date clock contained in a compact ROM case. RTC-10 makes it simple to access the time and date with just a few Basic PEEKS. A 2-year + replaceable battery (included) keeps time accurate when the computer is off and even when the cartridge is unplugged.



ONLY \$69.00

Compatible with any 16K or greater. Extended or non-extended Color Computer, RTC-10 may be used with or without a Radio Shack or any other Multi-Slot unit. To use it with a disk, without a Multi-Slot, order the Y-cable below

Completely assembled, tested and ready to plug-in and use, with programs included for clock setting and for continuosly displaying the Time/Date in the upper right corner of the video

COCO CABLES

Top quality cable and connectors with all gold plated contacts......

Y-CABLE- 40 conductor, 1 ft. long, 1 Male, 2 Females. Allows you to connect your disk controller pack and the RTC-10 Clock or most voice synthesizers, etc. ONLY \$29.95

DISK PACK EXTENDER CABLE: 40 Conducter, 2 ft. long, 1 Male, 1 Female. Lets you place your disk controller pack where you want it, out of your way ONLY\$22.95

CUSTOM FLAT CABLES- Call-in or send us your requirement. We will quote a reasonable price for the cable you need.

Custom Computer Products 6 Dogwood Court Goshen, NY 10924 (914) 469-2043

ADD \$3.00 PER ORDER FOR SHIPPING & HANDLING FOR C.O.D., INCLUDE AN ADDITIONAL \$3.00
NY RESIDENTS MUST INCLUDE SALES TAX.

REVIEWING

CALORIE COUNTER

Editor:

In looking over my review of Draco Software's Calorie Counter in the January RAINBOW, Page 220, I find it is possible

even to surprise myself.

First, let me say that Calorie Counter is the easiest to use and most complete program of its type I have yet come across. As such I can without hesitation recommend it to the casual dieter or anyone interested in keeping track of calorie intake.

Having said that, I would like to amend my introductory line, "... just what the doctor ordered." A diet is something most of us take for granted, and, if of normal health and sound body, we can afford to. However, in cases of other than "normal" health (pregnancy, any illness, attempts to lose more then a few pounds) an unsupervised diet can lead to serious problems. In these, or any situation where there is any question, no computer program can take the place of a trained health care professional.

If the above is kept in mind, I believe that any user of Draco Software's Calorie Counter will find it both easy and satisfying to use and a reasonable value for the money.

Nevin J. Templin Willingboro, NJ

HANDS ON

Editor:

As an owner of the Hands On package reviewed by Mark Williams in the November 1984 issue of THE RAINBOW, Page 206, I agree that it is a fine package. I think that Mr. Williams did a very good job on this review. There is one thing about my Hands On package that differs from the copy that

Mr. Williams reviewed. I am able to make unrestricted backup copies for my own use using Disk BASIC's BACKUPØ command. (I used no backup utility.) There are no instructions in the Hands On documentation for making a backup, but I tried it and all programs on the Blackboard activity disk and the Color It activity disk work flawlessly. I agree with Mr. Williams that the inability to do backups for programs for children is a distinct liability, even when free replacements are available. I have two young sons and use only my backup disk while keeping the originals in a safe place. I bought my Hands On package from Tandy Home Education in September, 1984. It is in the same packaging as in a Radio Shack store. The version on the "registration for modification notices" is 01.00.00. I presume that Mr. Williams has a different number on his copy.

I hope that my comments will be useful to Mr. Williams and your readers. I commend him on a fine review.

Gail Allinson Brookfield, IL

BAKERSFIELD KENO

Editor:

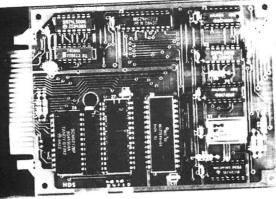
I received Michael Nowicki's review the other day concerning my program called Bakersfield KENO. I have to admit that I was a little more than just thrilled at his comments considering that [this] is the first commercial program I've attempted.

I just wanted to clear up one little point. The game picks 20 winning numbers "just like Vegas, Reno, Tahoe" and not 15 as stated in the review.

> David Seibold Bakersfield, CA



2nd Generation !!!!! **HDS Floppy Drive Controller Board**



AS SEEN AT THE RADIO SHACK COMPUTER SHOWCASES

New Low Prices!

DISK DRIVE SYSTEMS

SINGLE SIDED DOUBLE SIDED

Drive 0 Complete \$249. Drive 1 Complete \$169. Drive 0 & 1 Dual Drive \$399.

\$209. \$479.

\$289.

64K UPGRADE KIT \$39.95

Features*

- Gold Plated Edge Cards
- Dual Selectable ROM Sockets
- · No POTS to adjust
- Compatible with COCO I & II
- 120 Day Warranty
- Double and Single Density

So what's so new in our second generation? We had a lot of requests for the need to use the lesson expensive 28 pin Eproms Our 2nd generation controller allows the useage of either (two 24pin BOMS), or (one 24pin BOM and one 28pin BOM). The second feature we added was a technical one and is not apparent to the average user. Western Digital was good enough to manufacture for us a far advanced drive controller chip, called the WD1773FDC This chip integrates the data separation method within itself allowing the cleanest data transfer to date

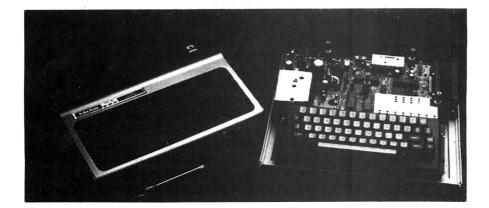
Reduce your I/O errors with the Hard Drive Specialist Floppy Drive Controller for the Color Computer Gold Edge Card Connectors. Advanced Design, and the absence of potentiometers make this the best board available to date

Completed and Tested Board with Radio Shack ROM		139.
Completed and Tested Board without ROM	\$	119
Bare Board with instruction manual	•	40.
manual	Þ	40.
ROM	\$	40.
Radio Shack ROM	\$	20.

NEW ROM

HDS has licensed the ROM from Radio Shack to be able to offer alternative operating systems pre-blown ready for installation. The first of what we hope to be a wide range of options is ADOS ADOS is a product of SpectroSytems of Miami Florida and if fully supported by the author The HDS version of ADOS supports 2 drives, 40 track, 6ms trk-to-trk drives only, either Single Sided or Double Sided The ADOS package comes complete with original documentation and diskette from SpectroSystems and can be installed in our Drive Controller Board at purchase time for no additional charge

ADOS/HDS 24 pin ROM		
(useable in all drive controllers on the mar	ket)
ADOS/HDS 28 pin ROM	\$	40.
(useable in the HDS 2nd generation board	or	ily)



Keytronics Keyboard KB500

The Fantastic Keytronic Keyboard is now being manufactured only for Hard Drive Specialist, It is the only keyboard for the Color Computer known on the market that does not use membrane switches The KB500 uses a capacitance foam switch. This type of switch will never give keyboard bounce and last much longer than all other types. The KB500 is also the only keyboard that will fit all versions of the color computer weather it is a A, B, C. D. E. F. ET. TDP-100. COCO IIA. or COCO IIB. One keyboard fits all with out risk of getting the wrong version, and there is no need to do any modifications to your case. Additional features include a higher spring force on the break and clear key to reduce the possibility of a disastrous key-stroke, sculptured keys, low profile, "pips" on home row keys. The "PF" function key comes with documentation and a sample program. The Keytronics/HDS keyboard list price was \$89 when it was offered through Keytronics. Our price on it is only \$69. plus \$3 for shipping

HARD DRIVE SPECIALIST

Use our Watts line to place your order Via Visa. MasterCard. or Wire Transfer. Or Mail you payment directly to us. Any non-certified funds will be held until proper clearance is made. COD orders are accepted as well. as purchase orders from government agencies. Most items are shipped off the shelf with the exception of hard drive products that are custom built UPS ground is our standard means of shipping unless otherwise specified. Shipping costs are available upon request

1-713-480-6000 Order Line 1-800-231-6671 16208 Hickory Knoll, Houston, Texas 77059

Comparable RS-232 Packs: Tandy Deluxe Program Pak And PBJ 2SP-Pak

One of the things that makes the Color Computer so desirable is that you do not have to buy extra plug-in boards in order to make it drive a printer or a modem. The reason for this is circuitry that comes with every CoCo allowing it to talk to the outside world through what is known as an RS-232 port. So why would anyone want to buy such a thing as a plug-in card when the RS-232 port is already built into the computer?

First, the CoCo has only one built-in port. If you need to use both a printer and a modem, you have to either plug and unplug each of them time and again, or buy a hardware device that switches between them. Even with such a switcher, you still are unable to use both at once. And some find the need to switch annoying. So, one reason to buy a hardware RS-232 device is to provide a second port for your computer.

More reasons relate to the nature of the CoCo's built-

SIMON

© 1984 Derringer Software, Inc.

Wouldn't it be nice if you could run through a BASIC program, answer prompt after prompt, and then have the same responses generated again with the touch of one key? You can with **BIMON!**

SIMON will "watch" you run through any BASIC program and keep track of every keystroke you make. The keystrokes can be saved in a disk file so the next time you want to perform the same procedure, **SIMON** will do it for you.

SIMON can remember 6000 keystrokes (including mistakes) and will faithfully repeat them for you at anytime. A custom menu can be created so that the press of one key will have **SIMON** run your BASIC program(s) and select the appropriate command file to use. You can even have **SIMON** pause at any input so that you can enter information that won't be the same each time.

BIMON is perfect for any type of reporting, file maintenance or any other program that requires a sequence of prompts to be answered each time it's used. This works especially well with our PRO-COLOR-SERIES programs.

Requirements: 64K Color Computer with Disk.

Send check or money order for \$24.95 + \$2.00 S&H to:

Derringer Software, Inc. P. O. Box 5300 Florence, S. C. 29502-2300

Visa/MC call: [803] 665-5676—10:00am to 5:00pm EDT.

in port. That port is what we call a "software RS-232." That is, in order to send and receive information through that port, the CoCo must create and analyze the RS-232 signal using cumbersome software that is somewhat inaccurate and, worse yet, eats up a great deal of the central processor's time. If all you need to do is drive a printer or use a smart terminal program at no greater than 300 Baud, this is not a great problem. But if you want to do both at once, or if you want a smart terminal program that functions with true full duplex at 1200 Baud, a hardware UART is required. Due to the limitations of the built-in software UART, it is impossible to write a smart terminal program that functions competely correctly at 1200 Baud with the CoCo's built-in port (Colorcom/E, sold by Spectrum Projects, comes closest to doing this).

For those of you using OS-9, there is even more reason to consider buying a hardware RS-232 port. Because the software RS-232 is so time-consuming, if you try to use the power of OS-9 to print out material as a background task while running another program (in effect spooling the printer via OS-9), the other program(s) will run badly, often unusably slowly. But with a hardware RS-232 port, the process of outputting data takes 10 to 100 times less time, and printer spooling can be accomplished very effectively. A hardware RS-232 port is also a must if you plan on having a second user hooked in through a terminal under OS-9.

Of course, you must either be able to write or buy software to use these pieces of hardware. OS-9 users may know by now that the new release of OS-9 from Tandy will now support both the Tandy Deluxe RS-232 Program Pak and one port of the PBJ product (the PBJ 2SP Dual RS-232 Pak) as both are addressed to the same place. PBJ has available a series of patches for OS-9 for both of its ports. Disk BASIC users will be happy to learn that Tandy and others will soon be coming out with disk-based smart terminal programs that can use the hardware RS-232 port. CompuServe's VIDTEX will soon be released in an updated version that makes use of such special hardware. And I am currently beta testing a smart terminal program that uses this hardware. Thus, by the time you read this, even Disk BASIC users should be able to buy software that uses this hardware.

Similarities of the Two Products

Both the Tandy and the PBJ product are similar in size, shape and cost. Both products must be used with an expansion port device if you want to use them with a disk drive. Both have a hardware RS-232 port addressed at \$FF68 that uses the same 6551 ACIA chip to create the port. Both have the address of the port fully decoded, meaning that the port will work regardless of which slot you put them in your expansion device and regardless of which slot you select. Both products have the capability of placing a ROM or EPROM on board the device, though in both cases the EPROM on the device is addressed using the *CTS line, meaning that in order to use any software in the EPROM you must select the slot the device is plugged into. Both products work as advertised. Both are designed to provide the required positive and negative RS-232 voltages using as input only the 5-volt line. That is, both will work when plugged directly into a CoCo 2. Full technical information, including schematic diagrams, is available for both from their respective suppliers. Both Tandy and PBJ are to be commended for this policy.

federal Hill Software

FINE PRODUCTS FOR THE COLOR COMPUTER, DRAGON AND MC-10

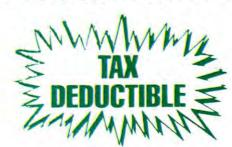


You Need Coco-Accountant II

Were your taxes a mess last year? Do you look at your bank balance and wonder where all the money went? Then you need Coco-Accountant II. This 32/64K home and small business accounting program is all you need to answer the Three Big Questions about your money: Where did it come from? Where did it go? And what can I deduct from my taxes?

Spend a few minutes with your canceled checks, credit card receipts and payroll stubs. Here's what Coco-Accountant II will do:

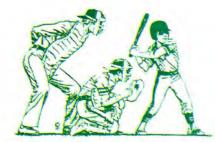
★ List and total expenses or income by account. ★ List and total expenses and income by month, with net cash flow report. ★ List and total expenses or income by payee/income source. ★ Year-to-date summary by account. ★ List and total tax deductible expenses. ★ List and total expenses subject to sales tax-even compute the sales tax you paid! ★ Print a spreadsheet showing activity by account and month for a whole year (Seeing is



believing!). ★ Balance your checkbook. ★ All reports (except spreadsheet) to screen or printer.

* Store data on tape or disk.

The 32K tape version stores 450 entries in a single file; 32K disk stores 500. The 64K versions store 900 entries on tape or disk. Our happy customers say this is the most useful program they own, and you'll agree! Only \$34.95, tape or disk. Please state memory requirements.



Baseball Statpak!

Your Little Leaguer, manager or coach will love these Big-League stats! This package of 16K Ext. Basic programs will track your hitters, pitchers and teams, with beautiful screen displays and printouts. Batter's Scorecard keeps records of 180 hitters, including AB, hits, batting average, RBI's, home runs, walks, strikeouts and On Base Percentage. Pitcher's scorecard includes games and innings pitched, earned runs, ERA, hits, walks, strikeouts and won-lost record. Team Scorecard keeps team standings for an entire league. Lightning fast sort by any statistic for incredible reports! Whether you're involved in Little League, high school, college or company softball, Baseball Statpak will make you an instant winner! \$28.95 on tape, \$31.95 on disk.

64K Breakthrough!

Did you teel gypped when you found out your "64K" Color Computer had less than 32K of memory in BASIC? We sure did. So we invented HID 'N RAM, the most powerful 64K programming tool on the market! With HID 'N RAM you can access that "hidden" 32K of memory and use it to store your data. A built-in machine language sort makes HID 'N RAM even more powerful! Write a 28K program and still have more than 30K left to store numbers. names, addresses or other stuff. HID 'N RAM is a small machine language driver attached to a BASIC demonstration program-a powerful mailing list that stores 450 names in RAM! We think the mailing list alone is worth the price of the program. Our complete instructions show you how to use HID 'N RAM. Once you have learned the techniques, you can delete our program and write your own! The HID 'N RAM driver stays with your program! If you can program in BASIC, you can use HID 'N RAM! Only \$27.95, tape or disk.

Call Toll Free (Orders Only) 1-800-245-6228



federal Hill Software

FINE PRODUCTS FOR THE COLOR COMPUTER, DRAGON AND MC 10



We accept checks, money orders, Visa and Master Card. Add \$1.50 for shipping. Make foreign orders payable in U.S. funds. Credit card orders should include card number, exp. date and signature.

825 William St. Baltimore, Md. 21230

301-685-6254



- memory like a fast disk drive.
- Un-DISK can store BASIC and MACHINE LANGUAGE programs.
- Un-DISK is INVISIBLE. Yup! Un-DISK does not interfere with normal Color Computer Operation.
- Un-DISK appears only when you type the magic word VDOS.
- Un-DISK comes with comprehensive instructions which you may not need because:
- Un-DISK is self-prompting and easy to
- Un-DISK is provided on cassette.
- Un-DISK is faster than a slow clumsy DISK DRIVE and best of all . . .
- Un-DISK is CHEAPER than a DISK DRIVE!
- Un-DISK will work even if you already own a disk but WHY BUY A DISK AT ALL?
- Un-DISK should be in the library of every serious CoCo user even if you own a disk says Frank J. Esser, independent reviewer for RAINBOW Magazine!

But if your finances are limited, the Un-DISK can give you much of the power of the mechanical drive. Even if you already own a disk the Un-DISK can work like a super fast extra disk.

EXTRA...EXTRA...EXTRA... Additional Power For \$14.95

Only with VDUMP for the Un-DISK!

- · VDUMP lets you make a cassette backup copy of everything stored in the Un-DISK.
- VDUMP lets you save 5, 10, 15 or more programs on a single cassette tape file.
- VDUMP lets you switch Un-DISKs. With a single load operation replace a group of financial programs with a set of children's programs. (The new VDUMP tape overwrites the old.)
- VDUMP can allow you to save a whole lot of RAINBOW ON TAPE in a SINGLE file.
- VDUMP is the perfect companion to the Preble VDOS Un-DISK.

Available from Doctor Preble's Programs, naturally! Bringing you fine Color Computer Products Since 1983!

The Preble VDOS Un-DISK \$34.95
The Preble VDUMP\$14.95
Shipping & handling
U.S. and Canada \$1.50
or \$5.00 to other foreign points

VISA and MasterCard accepted



Order From: Dr. Preble's Programs 6540 Outer Loop Louisville, KY 40228 (502) 966-8281

Canadians may order from Kelly Software

Differences Between the Devices

Unlike the PBJ product which comes only with traces provided for soldering in an EPROM socket, the Tandy product comes with a terminal program on a 24-pin, 8K by 8-socketed ROM inside the device. This might seem to be a tremendous advantage, until you realize that the program supplied cannot use the disk drive. This is a serious limitation, because of its lack of support for disk systems and its overall poor structure and quality, I would advise potential buyers to ignore the supplied software in the ROM in the Tandy Pak, and look at that pack as solely a hardware port without software.

When one does that, the Tandy product doesn't look bad at all. The RS-232 port it provides connects to the rest of the world using an industry standard DB 25 connector, not the CoCo 4-pin DIN connector. The PBJ unit uses the "CoCo standard" 4-pin DIN connectors. In addition to the signal ground, transmitted data, received data, and carrier detect (DTR) line available with the CoCo's built in, or with the PBJ's port, the Tandy product also provides CD (Pin 8), CTS (Pin 5), DSR (Pin 6) and TD 8 (Pin 2). Thus, it represents a fuller implementation of the RS-232 protocol. If you wish to program an application that will need to use those other lines, your only choice in hardware packs is the Tandy product.

On the other hand, you can use your existing modem cables with the PBJ unit. And I know of no currently existing or proposed CoCo software that uses the extra

lines provided by the Tandy Pak.

The Tandy unit provides about plus and minus 10 volts on its RS-232 lines. The PBJ unit provides about plus and minus 4.7 volts. Both figures are within specifications for the industry standard for the RS-232 protocol. But because the Tandy unit puts out somewhat more voltage than the PBJ unit, it may be preferable for those few applications where you want to run 50 or more feet of RS-232 cable. I must add that I know of few users who need more than 10 feet of cable.

Assuming one does not use the ROM supplied with the Tandy unit, one has a 24-pin socket to play with. The PBJ unit is designed to support a 28-pin socket that you solder in. If you are a hardware hacker, this means that you can put up to a 16K by 8 (27128) EPROM in the PBJ unit, whereas the ceiling on EPROM size with the Tandy unit as supplied is an 8K by 8 (68764) EPROM. You really should call PBJ if you plan to use the traces provided for the socket. There are a few details of how to wire it that you should be aware of, depending on which EPROM you want to use.

Since many Radio Shack Computer Center employees know little about the Deluxe RS-232 Program Pak, it's rather hard to get good information on how to use it. PBJ, in my experience, is readily available to aid its customers with prompt and knowledgeable advice. The folks at PBJ are always up to date on what software — both third party and from Tandy — works with their

products.

Hackers will be delighted to learn that PBJ makes the 2SP available as a bare board with documentation. The price of this is \$19. But be warned: While the circuit is not very complicated, and all needed information is present, this is no Heathkit! You need some experience in electronics if you want to tackle the bare board. I built two of them, so I know! If you do decide to get the bare board, be sure to call or write PBJ for the latest revision of corrections

to be made to the board. If you plan to wire up the EPROM socket, this is especially important. Purchasers of the assembled and tested unit need not worry about this, as all my reports indicate the units ordered have arrived in excellent working condition.

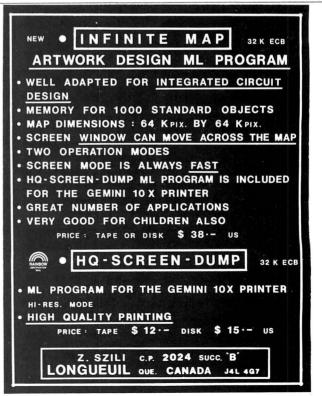
I've saved the biggest difference for nearly last. While the Tandy Pak provides only one hardware RS-232 port. the PBJ unit gives you two for almost the same price (only \$10 more)! One port is addressed to the same place as Tandy's (\$FF68), and should run with all software designed to work with the Tandy unit. The second port is addressed just above it starting at \$FF6C. To use the second port as a printer port, you'll have to alter the wiring of the busy line from your serial printer, as PBJ uses the "CD" pin of the port as its busy detect, whereas the CoCo proper uses the "receive data line," instead. If you are using the PBJ C-C Bus expansion port device as well, PBJ tells you how to "strap the interrupt lines" to use its device under interrupt control. This option (not available to Tandy Multipak users) is useful to folks using a multi-user OS-9 system on the CoCo, but for little else. Using this option requires significant hardware and software experience. PBJ also sells driver modules for the 2SP to be used with OS-9.

Recommendations

It's not an easy choice between these two excellent units. If you are sure you'll only want one hardware port forever, then the Tandy Deluxe RS-232 Pak is a good choice. It costs \$10 less than the PBJ product and is available at Radio Shack. But, if you are running OS-9, or if you're a hardware and/or software hacker, you may do well to get the PBJ product, because of the extra flexibility offered by having two, rather than one port.

(PBJ, Inc., P.O. Box 813, N. Bergen, NJ 07047, PBJ 2SP-Pak, \$89.95; Radio Shack stores nationwide, Tandy Deluxe Program Pak, \$80)

- Marty Goodman



24-Pin/28-Pin Adapter Answers EPROM-blems

We will now call together the monthly meeting of the Hardware Hacker's Society. First, we will have old business.

"Has anyone found a good source of 68764 EPROMS? All I can find for a reasonable price are 2764s."

"How about a way to speed up my 6 ms disk drives?"

"I sure like Spectrum DOS, but I can't run some machine language games."

"How about new business?"

The chairman of the society, Bob Rosen, addresses the meeting.

"I have the answer to all of these problems — 24-Pin/28-Pin EPROM Adapter from Spectrum Projects."

Meeting adjourned so we can all go home and try the new product.

The 24-Pin/28-Pin EPROM Adapter is not fancy. All it consists of is two sockets connected by a 3-inch piece of ribbon cable. One male socket plugs into the existing ROM socket in your disk controller, or your BASIC socket if you wish. The other end of the cable has a 28-pin socket that is adaptable to a 2764 (8K x 8), 27128 (16K x 8), or 27256 (32K x 8) EPROM. Address lines A13 and A14 are separated from the rest of the cable such that if an EPROM greater than 8K is used you can bank select the portion of the EPROM you wish to use.

What's the most practical use for this device other than being able to use the less expensive 2764 EPROM? Well, Bob sent us a 27128 EPROM already mounted on the board that not only has Disk BASIC, but Spectrum DOS as well. They are selectable by a small switch on the side of our disk controller. Another use that comes to mind is to switch between BASIC 1.1 and 1.2. If you have access to 27256 EPROMs you could select between four different DOSs.

The adapter kit comes with adequate instructions. For a 2764 EPROM, no additional wiring is necessary. The 27128 and 27256 EPROMs require a small switch (two for the 27256) to allow bank selection of the memory you wish to use.

What if I want Disk BASIC and Spectrum DOS on a 27128 EPROM? With a proof of purchase of a Disk BASIC ROM, and Spectrum DOS, Spectrum Projects (in San Jose only) will burn Disk BASIC and Spectrum DOS on an EPROM for an extra \$39.95. Contact Spectrum Projects for specific details. As shipped, you will have to supply your own EPROMs.

If you've ever tried to make an adapter socket to convert your CoCo for 2764s, I think you will like this gadget. In my opinion, it will save you time and money. No more burnt fingers, or melted sockets, trying to make your own.

(Spectrum Projects, Inc., P.O. Box 9866, San Jose, CA 95157-0866 or P.O. Box 21272 Woodhaven, NY 11421, \$19.95 plus \$3 S/H)

- Dan Downard

Inspect Your Programs With BASIC Searcher

BASIC Searcher is a machine language utility that searches through the lines of your BASIC program for any selected string of characters. The program can easily find variables or key words and phrases. It allows you to find your way through large programs looking for key elements.

BASIC Searcher operates from protected high memory and is called by a simple EXEC command. The program searches for the string of characters which you assign to the BASIC variable SF\$. You specify the line to start the search by assigning the line number to variable SL. Finally, you can specify output to your printer by setting SP=1, or direct the output to the screen with the default SP=0.

The program is supplied on tape for a 16K Color Computer. Simple instructions show you how to load the position-independent program for your particular memory size. The program is easily backed up to disk or tape. A two-page description of the program's operation accompanies the tape.

Typically, you search a BASIC program by typing in the simple commands SP\$=''STRING:''SL=0 (and optionally SP=0 or 1) followed by EXEC. The program then scans the BASIC text for the first occurrence of the "string" characters. The program presents you with the BASIC line containing the string. You then have the choice of pressing 'N' for the next occurrence, pressing 'R' for the rest of the occurrences, or 'X' to exit the command.

BASIC Searcher has several uses beyond simply finding a single word or phrase. The program can be used to list all DATA statements in a program by using DATA as a search string and pressing 'R.' Another simple application is to list all REM statements in a program as a means of documentation.

The program does its job precisely as specified. It doesn't miss any combinations of characters; I was unable to find any technical flaws.

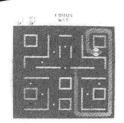
If you compose programs using a typical word processor or screen editor, these search features may already be available to you. But, for many beginning programmers, this search feature may be the answer to an unruly LIST command supplied with your built-in BASIC editor.

(Color Computer Utilities Unlimited, 3907 Bethel Rd., Boothwyn, PA 19061, 16/32K, tape or disk \$19.95 plus \$2 S/H)

- Stuart Hawkinson

RAINBOWfest CHICAGO May 17-19

VOVASOF * A TOM MIX COMPANY * r Last!

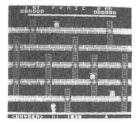






ou can see jungle, LARGE seen, sand, a large, rotting se, thick underbrush. Easily visible exits: South Rest

DE / Mou what?





BUZZWORM

This one will drive you nuts. Guide the snake around the screen eating the snakebait for points; but don't bite yourself! Lots of fun awaits you with this

> REQUIRES 32K & JOYSTICK TAP€ \$15.95 DISK \$18.95

BREWMASTER

Move along the end of the bars serving beer to your thirsty customers. Watch for falling glasses and rowdy customers. Loads of fun.

> REQUIRES 32K & JOYSTICK TAPE \$14.95 DISK \$17.95

BLACKBEARD'S ISLAND

A brand new high res graphic adventure. This one will blow your socks off! Wander around Blackbeard's Island being ever mindful of the hazards while your lust builds for Blackbeard's buried treasure. T'aint easy, matey!

> REQUIRES 32K DISK ONLY DISK \$19.95

PANIC

Climb the ladders and fight the "meanies". Dig holes and bury them. Hours of fun await you in this outstanding graphic arcade game. Enjoyment for all ages.

> REQUIRES 32K & JOYSTICK TAP€ \$14.95 DISK \$17.95

MONEYOPOLY

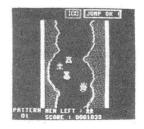
Now! Play this popular board game on your computer. Probably the most realistic computer board game simulation ever. Contains all the features of the original. Buy, rent or sell properties and become a wealthy land baron with this program.

> REQUIRES 32K & JOYSTICK TAP€ \$19.95 DISK \$22.95

TOP QUALITY SOFTWARE AT AFFORDABLE PRICES! WRITTEN BY WELL-KNOWN **AUTHORS IN 6809 MACHINE** LANGUAGE ESPECIALLY FOR NOVASOFT



EE.3



BATTLE STATIONS

BATTLE STATIONS is a remake of a popular board game. Without a doubt the most outstanding sound and graphics you have ever heard or seen. BATTLE STATIONS is a one player

interactive simulation of skill, strategy and luck. The player pits his tactical skills against the cold, cunning logic of the computer.

> REQUIRES 32K DISK TAP€ \$21.95 DISK \$24.95

VEGAS GAME PAK

Have you ever wanted to bring Las Vegas home with you? Now you can! Six different games in this package: Blackjack, Keno, Poker, plus three slot machine lookalikes. You'll swear you are at the table or the slots when you see the outstanding graphics we have created.

> REQUIRES 32K TAP€ \$24.95 DISK \$27.95



COLOR CAR

You asked for it and now here it is! Fast-moving Grand Prix style racing With your computer sit at the wheel of your racer through the difficult racecourse. Smash into other cars but be careful because they'll return the favor. Jump your car through the air, over water, and other hazards.

> REQUIRES AAK & LOUSTICK TAP€ \$19.95 DISK \$22.95

NO DEALERS PLEASE





CHECKS OK

Phone Orders (616) 957-0444 4285 Bradford N.E. Grand Rapids, MI 49506

*Add \$2.00 shipping & handling

Polish Appearance Of Cassettes With Cassette Box Insert Maker

Cassette Box Insert Maker is a very friendly, easyto-use program that will help make attractive inserts for the hard boxes your cassettes are kept in. Using this program, you can make a label with 13 lines of text on the front, four lines on the back, and two title lines for the edge of the box. To use the program you need at least a 16K Color BASIC CoCo, tape or disk system, and a printer.

There are three pages of documentation with this program. The documentation is well-written, but the program is so easy to use you probably won't need it after your initial use. Once Cassette Box Insert Maker is up and running, the main menu will give you nine options. The first three options: DO FRONT, DO BACK, and DO TITLE, allow you to create the text for your insert. The next three: EDIT FRONT, EDIT BACK, and EDIT TITLE are for editing the text. The last three options will allow you to either PRINT INSERT, ERASE MEMORY or SAVE/LOAD DATA.

Text is entered one line at a time. Each line can hold 39 characters. If you want, each line can be automatically centered. When this is done you are only allowed 38 characters per line. Cassette Box Insert Maker uses a line editor and if a change needs to be made in a given line, the entire line must be changed. Up to nine inserts can be made at a time, if you wish, when in the print mode.



KEEP - TRAK "DOUBLE-ENTRY" General Ledger Reg. \$69:95 — ONLY \$19.95 Accounting System

"Double-Entry" General Ledger Accounting System for home or business: 16k, 32k, 64k, User-friendly, menu driven. Program features: balance sheet, income & expense statement (current & "YTD"), journal, ledger, 899 accounts & 2350 entries on 32k & 64k (710 accounts & entries on 16k) disk only. Version 1.2 with screen printouts. For upgrade return original disk & \$5.00. 1.1 Rainbow Review 9/84

"OMEGA FILE" Reg. \$69.95 -- ONLY \$14.95

Filing data base. File any information with Omega File. Records can have up to 16 fields with 255 characters per field (4080 characters/record). Sort, match & print any field. User friendly menu driven. Manual included (32k/64k disk only).

"A M T" Reg. \$29.95 — ONLY \$14.95 Rainbow Review 10/84 AMT starts where everyone else ends. AMT calculates almost any sales or purchase outcome. Total interest, total principle, total payment are all figured. AMT is not just an amortization scheduling program, but a cost forecasting and prediciton program. Useful to anyone who plans to sell or buy something with interest. (Disk Only).

● IIIMINIII ● BOB'S MAGIC GRAPHIC MACHINE ● IIIMIIIIIII

Turns 2 weeks of graphic programming into 2 hours with 'rubber band' 'type graphics. Generate BASIC code to use in your programs. Easy drawing and manipulation of circles, elipses, boxes, lines and ARCs. Single joystick operation with on line HELPS at all times. Allows text on the graphics screen and movement of objects on the screen. Can be used as a stand-alone graphics editor. Great for programmers and LOTS OF FUN for the novice. Reg. \$30-95 — ONLY \$14.95 for cassette and \$14.95 for disk. 64k with ECB required. (includes instruction manual). GRAPHICS EDITOR

PERSONAL INFORMATION FILE—\$14.95 disk HOME INVENTORY—\$14.95 disk MEMO WRITER-\$14.95 disk CASH-IN (billing)-\$14.95 disk

GRADE EASY (teacher data base)-\$14.95 32/64k disk

64 K UPGRADE	\$42.00	VOLKS MODEM	\$59.95
FLIP & FILE 50	\$19.95	RITEMAN PLUS PRINTERS	\$275.00
FUJI-MAXELL SSDD	\$17.95	RITEMAN 15"	\$549.00
DATA DEFENDER 70 W/I	ock \$21.95	GENERIC DISKS SSDD	\$14.95

COMPARE FEATURES AND PRICE, then buy "THE OTHER GUY'S SOFTware!"

(add \$2.50 for postage and handling) Send check, money order or C.O.D., U.S. funds to: THE OTHER GUY'S SOFTware • 875 S. Main • Logan, UT 84321 PHONE (801) 753-7620 or WRITE for a FREE CATALOG

One of the more obvious ways to use this program would be to make an insert listing all the programs you have on a particular cassette along with the counter numbers. I find the index provided with RAINBOW ON TAPE is easy to get misplaced, etc., so the first thing I did with Cassette Box Insert Maker was to make an insert for my September RAINBOW ON TAPE. The result is very impressive. Below I have included an illustration of what a finished printout looks like.

Cassette Box Insert Maker is published by CoCo Freeware Clearinghouse, so to get a copy just forward a blank tape or formatted diskette along with a selfaddressed, postage-paid return mailer to CoCo Freeware and request program number 801A (the documentation program). Disk users should also request program number 801B, Extended BASIC users, 801C, and Color BASIC users, 801D. There is no purchase price, but after receiving and using the program, you can send a contribution.

If you have a lot of cassettes stashed away in hard boxes, this program would be an excellent addition to your library.

NAME	CTR#		NAME	CTR#		
CLOCK	021	:	DATABASE	113		
GOLDPILE	037	:	BYTMASTR*	122		
MCQUIZ	048	:	SCRAMBLR	125		
PRTVII	059	:	MADADDER	135		
PRTGEM	068	:	ABC GAME	153		
PATCH10*	077	:	AUDIOSPL	173		
PATCH11*	081	:	WORDLOAD	187		
DATELOAD	085	:	GEO GAME	196		
MYSTERY	090	:	MATHDRIL	219		
CALENDAR	108	;	CALGEN	237		
:				: < FOLD		
	RAINBOW ON TAPE					

SEPTEMBER 1984 ----: < FOLD

THIS TAPE PROPERTY OF: MICHAEL K. HUNT 1467 CASSETTE AVENUE DISKETTE, INDIANA 01010

(The CoCo Freeware Clearinghouse, P.O. Box 1084, Morgantown, WV 26507)

- Michael Hunt

NEW! NEW! NEW!

Draw flow charts, diagrams, or pictures! Use optional mouse and/ or keyboard to draw lines, squares, circles, polygons, rectangles and different size text. Like MacPaint! Pictures can be printed, saved and loaded

Cassette . . . \$24

Print, plot or input from any of up to 16 WINDOWS of any size using 9 new BASIC commands. Each window can mix graphics and characters and has automatic scrolling. Demo program included.

Cassette

MUSIC SYNTHESIZER: Create quality sounds by controlling 24 harmonics. Easy to create and play impressive sounds. Uses graphics with optional mouse or keyboard to modify sounds. Sounds can be saved and loaded.

All are written in machine language and have full documentation. **ESSENTIAL ENGINEERING**

P.O. Box 26516 San Francisco, CA 94126

(California residents please add 6% sales tax.) (Bay area & LA please add 6.5% sales tax.)

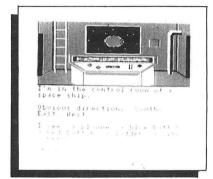




HI-RES ADVENTURES!

Disc not required • Cassettes - \$24.95 • Discs - \$27.95





This exciting hi-res adventure begins aboard the starship TREKBOER in the 21st century. Life on Earth is threatened by a deadly virus and your mission is to search the frontiers of space and return with a cure to save mankind from disaster. But how? Where? The name of your starship provides the first clue.

PRESS RELEASE "Trekboer is the latest in the collection of fine adventure games from Mark Data Products. Sure to be





You are on a sandy beach

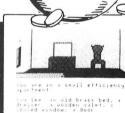
Obvious directions North South, East, West

hunt. 32K required.

You see a pirate, a boat, the

Hot CoCo—April '84 "The fine graphics accent your imagination."

adventure even more challenging



SEA SEARCH **SHENANIGANS** Get your shark repellant and scuba tanks ready! The graphics in this adventure are truly outstanding and the underwater scenes are unforgettable. You'll run into a pirate, a mermaid and some hungry sharks in this colorful and unique treasure hunt 3X required.

Countless legends tell of a magnificent Pot of Gold hidden at the end of the rainbow. Many have attempted to find the marvelous treasure but success has eluded them and it remains hidden to this day. You, as a dedicated adventurer, have determined to search for the fabled riches and succeed where others have failed. This one is great fun! 32K





BLACK SANCTUM

Encounter the forces of black magic as you roam around an old 18th century monastery. You'll see all the century monastery. You'll see all the evil locations in this spooky adventure; you'll love searching out and destroying the evil in this classic tale. A MUST for every adventure game fan! 32K required.

Rainbow—May '84 "It's the graphic screens that are the shining stars...Some of the best



CALIXTO ISLAND

A valuable museum treasure has been stolen, can you recover it??? This is a challenging puzzle with an occasional twist of humor. You'll visit a secret laboratory, a Mayan pyramid and you'll meet crazy Trader Jack—all in living color and exciting detail. You will really love this hi-res graphic version of the classic Calixto Island Adventure. 32K required.

Rainbow—April '84 "It was enough to keep my wife and 8 year old son glued to the computer for an entire weekend and two week nights."

FREE — Send for our NEW 24 page Catalog!



Mark Data Products

24001 ALICIA PKWY., NO. 207 • MISSION VIEJO, CA 92691 • (714) 768-1551

SHIPPING: All orders under \$100 please add \$2 regular, \$5 air. All orders over \$100 please add 2% regular, 5% air. California residents please add 6% sales tax. Orders outside the continental U.S., check with us for shipping amount, please remit U.S. funds. Software authors—contact us for exciting program marketing details. We accept MasterCard and VISA Distributed in Canada by Kelly Software

TALKHEAD And Real Talker Reveal New Dimension In Voice Synthesis

By Kenneth D. Peters

Not only can your CoCo have a voice, but a realistic, masculine face to go along with it! Colorware has an animated "Talking Head" program that uses high speed, Hi-Res graphics to create a realistic audio-visual simulation. TALKHEAD requires a 64K CoCo and the Colorware Real Talker voice pak, but the combination may be hard to beat!

I used both the cassette and disk versions of TALKHEAD and found no difference other than speed of loading. Disk users simply insert the disk and run TALKHEAD (a BASIC loader program); cassette users CLOAD and RUN, which takes four minutes longer. The rest is automatic. Three machine language modules are loaded and executed, apparently containing an English text-to-phoneme code translator, the graphics for the head, the movement of eyes, mouth and jaw, and the Colorware logo. Colorware has its own unique audio-visual logo presentation that can't be missed! When the logo is finished, the TALKHEAD face appears and says "Talkhead ready."

CO CO -ADS A MONTHLY CLASSIFIED NEWSPAPER FOR COCO OWNERS, SELL OR TRADE YOUR UNWANTED PROGRAMS OR HARDWARE IN THIS NEWSPAPER. FIND GREAT BARGAINS.CIRCULATION - OVER 15,000 COCO OWNERS. LIST YOUR CLUB OR BBS. FULL OF TIPS. PROGRAMS, ARTICLES AND REVIEWS. DON'T DELAY, SUBSCRIPTION IS ONLY \$5.00 FOR 12 ISSUES CLASSIFIED AD'S AT ONLY .25 PER WORD Yes I would like a subscription to COCO ADS Address City State PLEASE HAVE CHECKS PAYABLE TO P D SOFTWARE P 0 BOX 13124 HOUSTON, TEXAS 77219

At this point, "Talkhead" is ready for anything you care to do next. You can experiment with typing various words and phrases for Talkhead to say, write a program and come back to Talkhead, or load programs from tape or disk that already utilize Talkhead's ability. A demo program is provided on both disk and cassette versions called Daisy. Remember the song "Daisy, Daisy, give me your answer true . . . "? Well, I must have been half crazy for running the demo so many times! RUN "DAISY" gives a fairly good rendition of the song done by none other than Talkhead himself - I was impressed by both the audio and the visual achievement of TALKHEAD. It's a simple song, and it's not perfect, but I've heard worse singers. The Talkhead face seems so life-like I caught myself following the movement of his eyes and mouth just as I would if listening to another person. The three-dimensional quality graphics of the head combined with the appropriate movement of the eyes, mouth and jaws during synthesized speech is quite realistic and well-done.

Daisy demonstrates what can be done with TALKHEAD. But more importantly, a look at the program also shows how easy programming Talkhead can be in BASIC. Two new commands are available: SAY and PITCH.

SAY is very similar to the PRINT command. Assuming TALKHEAD is loaded and ready, you can simply type: SAY 'HELLO. I AM MR. TALKHEAD'' (and press ENTER). The screen immediately changes to Hi-Res graphics, filled with the life-like three-dimensional figure of Talkhead, and he begins talking. When he's through talking, the graphics screen disappears and you are returned to the text screen. Talkhead always appears on the screen automatically whenever he has something to SAY.

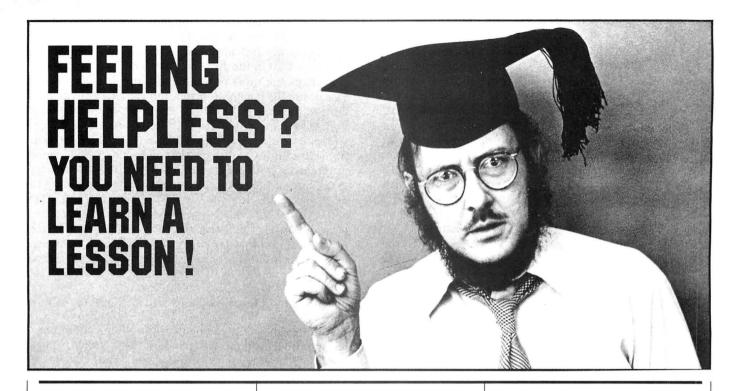
Talkhead speaks words or phrases in the immediate mode or within a program. Either way, four rules must be followed:

- 1) SAY must be the only command on a program line. No other commands, functions or statements are allowed on the same line.
- 2) You cannot use string manipulation, for example SAY (A\$+B\$), within a SAY statement.
- 3) The length of the expression following the SAY command is limited to 232 phonemes or approximately 35 words.
- 4) Numeric variables must be converted to string variables first if you want to SAY the numeric variable.

All the rules are simple to follow and pose no problems, especially if you are beginning to write a program from scratch.

A little extra work may be required, however, to convert one of your existing programs for use with TALKHEAD. Putting TALKHEAD to a more practical use, I modified a spelling program I had written using the Real Talker with the old text-to-speech translator software, in which U=USR(A\$) had to be used everytime you wanted the value of A\$ spoken. TALKHEAD uses the new "enhanced" software for the Real Talker, which simply uses SAY A\$ whenever you want to have the value of A\$ spoken. (This

See You At RAINBOWfest CHICAGO May 17-19



MICRO LANGUAGE LAB : LEARNING THE 6809

eeling at the mercy of a programmer somewhere? Mystified by a machine? My Micro Language Lab will give you the power to end those helpless feelings.

Here's why. The heart of *any* computer program *anywhere* is machine language. Every piece of software uses it — your favorite game, spreadsheet, word processor, data base manager, or recipe file. Every time you hit "Enter", it's working. All the languages and operating systems are created from it. Basic, Fortran, Pascal, Flex, OS-9,

TRSDOS...they're 6809 machine language, the whole lot!

And you can learn the language of the 6809, the programming heart of your Color Computer, with my Micro Language Lab.

Not everyone can program. Writing a few lines in Basic now and then doesn't make you a programmer. But if you *can* program, then my Micro Language Lab will teach you — the right stuff, the right way.

I'll teach you in 24 half-hour lessons on 12 audio cassettes, with a 220-page textbook, with data booklets, with 35 sample programs, and with a programming reference card. You'll spend 50 hours or more with my course, listening, watching, and working. And when

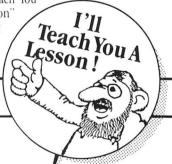
you're done, you'll be programming your Color Computer in the 6809's language.

Stop ignoring those gnawing feelings of helplessness. The 6809 is where the power lies in your computer. Turn on that power with the Micro Language Lab.

• Micro Language Lab, \$99.00 (plus \$3.50 shipping and handling) Requires 16K Extended Basic EDTASM +

Not sure? Write or call for a Table of Contents and sample pages — and your "I'll Teach You

A Lesson' button!



ALSO AVAILABLE FROM GREEN MOUNTAIN MICRO

(Add \$2.50 shipping and handling to your order)

Lowerkit III

- Full-time upper and lowercase installs in 15 minutes.
- Normal and reverse video standard
- Fully compatible with all Alpha and Graphic modes

\$79.95 assembled and tested \$49.95 complete kit of parts Important! Specify Color Computer or Color Computer II

TV Buff II, clear image for video monitors, \$19.95 (specify CoCo or CoCo2)

CoCoPort parallel interface (now includes plastic case), \$54.95 / \$44.95 kit

ColorPack ROM/RAM pack, \$29.95 (specify configuration) / \$19.95 kit / case \$3.00 extra

64K memory upgrade kit with full instructions, \$49.95 / with memory test on tape, \$54.95

Color Quaver Software Music Synthesizer on tape (requires 32/64K), \$19.95

Color Burner EPROM Programmer (2716/32/32A/64/64A/128, 68764/66) with software, \$69.95 / \$56.95 kit

User Group, Educational, Club and Dealer Discounts are available.

TRS-80 and TRSDOS are trademarks of Tandy Corporation. Flex is a trademark of TSC, Inc. OS-9 is a trademark of Microware Corporation.

Green Mountain Micro

Bathory Road, Box R Roxbury, Vermont 05669 802 485-6112

Hours: 9am - 5pm EST, Monday - Friday COD/VISA/MASTERCARD

software has been available since about May 1984.) So, if you have been using the new, improved software for Real Talker, you should find TALKHEAD can be used immediately without any modification of your programs. I, on the other hand, had to substitute the new syntax (SAY A\$) for the old syntax (U=USR(A\$)). Being in the habit of writing programs with multiple command lines, I soon found there was more to do than simple substitution. After making the necessary substitutions, each multiple command program line with SAY had to be broken away from the sequence and placed on a separate line by itself. It took a little more work, but the end result was worth it.

My son, aged 7, had used the old spelling program (using the voice synthesizer without TALKHEAD) extensively in first grade last year. He thought it was really neat to "see someone" on TV giving him his spelling words! My older daughter, aged 10, agreed. Even my preschooler wanted Talkhead to do her spelling words, (she doesn't have any!). But she is satisfied with just being able to type in letters and words she knows to see Talkhead speak. She is in speech therapy, so I hope to use TALKHEAD and the Real Talker to help her.

I spent a lot of time talking about SAY and the use of one command line, but it's an area of interest that must be considered more by those people who purchased *Real Talkers* prior to May 1, 1984, and consequently might demand modifications to their existing programs in order to incorporate *TALKHEAD*.

The second rule states you cannot manipulate strings within a SAY command, for example: SAY A\$+B\$. You can issue the command SAY A\$ for any value of the string A\$ just as well as SAY ''THIS IS THE VALUE OF A\$''. Manipulations have to be done prior to wanting to say the final result: C\$=A\$+B\$ then SAY C\$.

A single SAY line is limited to about 35 words or 232 phonemes. When you think about it, that is anywhere from four to six lines of text on a standard CoCo screen. If that's not enough, you can use multiple SAY lines (many program lines with one SAY command) or READ in the string variable within a loop.

SAY requires a string format, thus either a string variable or the text within quotes is required. Therefore, if you want to SAY a numeric variable (for example the value of X), you must first convert the numeric variable to a string variable using the STR\$ function in BASIC.

I mentioned earlier that there were two new commands to use *TALKHEAD* in BASIC. The other command is PITCH. *TALKHEAD* was programmed to "simulate" singing "Daisy" by the use of the PITCH command. PITCH, which can be abbreviated PI on a command line, varies the pitch of the phonemes, words or phrases following the PITCH command. The value of PITCH remains in effect until a new value is issued. If none is issued the default value is 1. Pitch levels available are 0, 1, 2 and 3, with zero being the lowest and three being the highest.

Intrigued by the demo song, I just had to try my hand at composing. Well, actually I didn't compose it, but I programmed Talkhead to sing it for me. Ten to 15 minutes of programming had Talkhead singing "Mary Had a Little Lamb."

TALKHEAD is really the "enhanced" Real Talker's machine language text-to-speech translator combined with the digitized Hi-Res graphics of the head, so up to now anything other than graphics that has been said about TALKHEAD also has described the "enhanced" updated

Real Talker software. A few additional comments about Real Talker are necessary here to point out other improvements and additions to it since my original review of it appeared in the July '84 RAINBOW.

Perhaps the most noticeable difference is the increased ease of use for the BASIC programmer. There are no DEFUSR or USR statements to worry about. In making the Real Talker extremely user-friendly, only one thing is left for you to remember: You must LOAD and EXEC the Real Talker's translator utility software first before you load another program or start programming! The utility automatically takes care of the rest, relocating itself and providing three new commands for you to use in BASIC: SAY, PITCH and CONVERT. The first two commands have already been discussed. CONVERT creates a stand-alone, talking BASIC program that no longer requires use of the machine language translator program. In other words, plug the voice pak in, load your CONVERTed BASIC program and it talks! All program lines with SAY literals (e.g., SAY "Hello") in your program will be converted to stand-alone talking lines.

Among other improvements is the Phoneme Editor now has an improved and expanded Help screen, and the translator now recognizes and understands (pronounces) dollars and cents whenever a '\$' is encountered. Finally, ASCITALK has been added to the Real Talker support software. This program will recite any ASCII file, from a word processor or a terminal program, line by line!

I can't think of anything I don't like or would add to the programs, nor have I found any faults with the documentation. Documentation for both *TALKHEAD* and the enhanced *Real Talker* seems to be quite thorough. I checked every sentence and tried every example. Both documentation booklets were extremely well-written with easy-to-understand explanations and examples. These programs were a pleasure to use in BASIC.

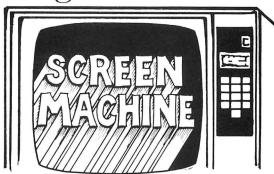
The cassette version of both programs can be transferred to disk should you upgrade to disk. Documentation gives complete and clear instructions on transferring to disk. I actually did the transfers and ran *TALKHEAD* and *Real Talker* from that copy; it was no problem. Everything performed as it had from the cassette version. For disk users, this software will not run on JDOS. I had to switch to Disk BASIC.

If you have Colorware's *Real Talker* and a 64K machine, don't deprive yourself of the exceptional graphics and realism of *TALKHEAD*. If you have the old version of *Real Talker*, you might consider updating, with its added features and increased ease of use. I have all four speech units for the CoCo and definitely feel *Real Talker* has become the simplest to use in a BASIC program — just SAY "Whatever". It's a fast, easy and convenient way to make your program talk!

If you're looking for a practical reason to buy TALKHEAD and Real Talker, my kids have all used the program and feel they would rather have Talkhead give them their spelling words and math problems than just having to look at a screen without the face! We're all in agreement in this household that TALKHEAD is a good addition to the voice and makes a great head for the Real Talker voice pak.

(Colorware, 78-03A Jamaica Ave., Woodhaven, NY 11421, 64K ECB, tape or disk \$29.95; *Real Talker* 16K ROM pack and tape \$59.95; \$69.95 for CoCo 2 version)

Sugar Software



RAINBOW SCREEN MACHINE

SCREEN MACHINE

- The Rolls Royce of graphics/text screen enhancers more screen features than all others combined!
- Add these features to your computer/program: ML extension of Basic loads on top of 16, 32, or 64K machines to enable easy mixture of hi-res graphics and text in your programs. Dense text or large lettering for children, visually impaired or VCR title screens with no programming!
- User definable 224 character set featuring lower case descenders, Greek, cars, tank, planes, etc., completely interfaced with all keys, commands, and PMODES. 12 sizes (most colored) from 16 x 8 to 64 x 24. PRINT (a, TAB and comma fields are fully supported.
- 2 distinct character sets automatically switch for sharpest lettering featuring underline, subscript, superscript, reverse video, top and bottom scroll protect, double width, colored characters in PMODE 4, and help screen.
- Simple 2-letter abbreviated commands inside your program or control key entry from keyboard, even during program execution!
- Includes demo program, **character generator** program and manual. 16K Ext. Basic required 32K recommended. \$29.95 Tape; \$32.95 Disk.

Screen Machine can be used in games, word processors, utilities, etc. In addition, the custom graphics characters can be used to develop easy, effective hi-res character-graphics programs. The potential is truly unlimited.

Screen Machine can be used to directly create video recorder ommended just a few minutes spent studying and referencing title screens or large lettering for children or the visually impaired simply by typing.

- Revolutionary heralded as the most useful, powerful and versatile state-of-the-art utility ever developed for the Color Computer!
- All of the features of Screen Machine and more:
- Variable SMOOTH Scroll for professional displays, listings, business use.
- Variable volume KEY Click (tactile feedback).
- $\mbox{\bf EDTASM} + \mbox{\bf command}$ for instant compatibility with cartridge EDTASM
- Superpatch + command for instant compatibility with the Superpatch + Editor-assembler
- True Break key disable and recognition.
- 10 User Definable commands used to activate your special drivers or subroutine.
- Dynamic Screen Dump command for use with Custom Software Engineering's Graphic Screen Print program for simple printer "Snapshots" of your screen even during program execution!
- The new standard Upgradeable at any time from previous Rainbow-Writer or Screen Machine purchase. Return old program, manual, plus cost difference and \$7.00 shipping and handling.
- Super Screen Machine \$44.95 Tape; \$47.95 Disk.

Screen Machine is fully interfaced with all keys and commands. Although some Basic programming knowledge is recyour computer's Basic manuals will turn you on to the power of computing with Screen Machine.



A complete catalog of other sweet Sugar Software products is available.

SUGAR SOFTWARE

2153 Leah Lane Reynoldsburg, Ohio 43068 (614) 861-0565

No refunds or exchanges.

VISA

Add \$1.00 per tape for postage and handling. Ohioans add 5.5% sales tax. COD orders are wel-come. CIS orders EMAIL to 70405, 1374. Dealer inquiries in-



COMPUTER SOFTWARE AND ACCESSORIES



PHINIERS	
¥ SPIRITp (80 CPS F/T)	j
OKIDATA 82 (SER.) W/COCO CABLE\$329.00	j
OKIDATA 92 (PAR)\$394.00	j
(160 CPS Draft - 40 CPS Correspondance Quality)	
OKIDATA 93 (PAR - 15" CARRIAGE)\$595.00)
(160 CPS Draft - 40 CPS Correspondance Quality)	
CITIZEN MSP-10\$353.00)
(160 CPS Draft - 40 CPS Correspondance Quality)
* PANASONIC KX 1090 (PAR) (80 CPS F/T)\$247.00)
* PANASONIC KX 1091 (PAR)\$306.00)
(120 CPS Draft & 22 CPS Near Letter Quality)	
EPSON CODE COMPATIBLE	

PRINTER INTERFACE (Serial to Parallel)

pbh (PRINTER 8	MODEM CONNECTIONS)	\$59.95
	WITH PRINTER	\$54.95

MODEMS

VOLKSMODEM WITH ALL CABLES (300 BAUD - MANUAL ANSWER/DIAL)

NEW! A GREAT BUY! NEW!

VOLKSMODEM 1200 WITH ALL CABLES....\$224.95 (300/1200 BAUD - AUTO ANSWER/DIAL)

MONITORS

AMDEK (2 YEAR WARRANTY)
COLOR 300 (COLOR COMPOSITE AND B&W MODE)
(REPLACES OLD COLOR I) \$262.00
VIDEO 300 (GREEN, NO GLARE)\$149.00
VIDEO 300A (AMBER, NO GLARE)\$155.00
NAP (AMBER W/AUDIO)\$95.00

MONITOR INTERFACES

KEYBOARD

SUPER PRO BY MARK DATA	\$56	6.95
(NOT FOR COCO II)		
ADAPTER (FOR POST - 10/82 COCO)	\$	3.95

AUTOTERM/MODEM SALE!

DISKS	1 BX	2 + BX
VOLKSMODEM 1200 (See Below) .	\$249.95	\$254.95
VOLKSMODEM (SEE BELOW)	\$95.95	\$99.95
AUTOTERM WITH		D

DISKS	1 BX	2 + BX
ELEPHANT SSSD		
ELEPHANT SSDD.		
BASF QUALIMETRIC SSDDBASF QUALIMETRIC DSDD		

TAPES

C-10 (ONE DOZEN)\$7.50)
TWO OR MORE DOZEN\$7.00/DOZ	Z

DISK STORAGE

FLIP'N'FILE	10																		\$	5	45	
FLIP'N'FILE																						
FLIP'N'FILE	50															ж.	***		\$2	23	.95	
DISK BANK	5 (H	DL	_[2	6	5	0	١.				• >	. ,					\$	12	95	

JOYSTICKS/ADAPTERS

WICO JOYSTICK ADAPTER	\$18.95
WICO ANALOG JOYSTICK	\$38.95
(NO ADAPTER REQUIRED - FREE FLOA	AT OR
SELF CENTERING BIG BAT HANDLE - F	RUGGED!)

Look at These Discounts and Compare...Remember WE PAY SHIPPING!

SOFTWARE PRICES SHOWN ARE 20% OFF LIST PRICE!

SPECTRAL ASSOCIATES

	Т	D
CRYSTAL CASTLES	\$19.95	\$22.35
▶ GALAGON		\$22.35
▶ PENGON	\$19.95	\$22.35
COLOR PANIC		\$22.35
CUBIX		\$22.35
LANCER		\$22.35
▶ MS GOBBLER		\$22.35
WHIRLYBIRD RUN		\$22.35
LUNAR ROVER PATROL	\$19.95	\$22.35
COMPUTERWARE	т	D
STAR TRADER (32K CASS/64K DISK)		\$22.35
MAJOR ISTAR	\$19.95	\$22.35
SAM SLEUTH (64K)	\$19.95	\$22.35
▶ MR. DIG		\$24.75
▶ JUNIOR'S REVENGE		\$25.55
RANDOM BASIC (OS-9)		\$60.00
COLOR BASIC COMPILER		.\$31.95
64K SCREEN EXPANDER (64K)		
* THE SOURCERER (R DOS)		\$31.95
THE SOURCERER (OS-9)		
► MACRO ASSEMBLER & XREF (R DOS		
MACRO ASSEMBLER & XREF (OS-9).		
COLOR EDITOR		\$23.95
COLOR MONITOR		\$22.35
MOON HOPPER		\$22.35
BLOC HEAD (Q-BERT) DOODLE BUG (LADY BUG)		\$23.95 \$22.35
		\$21.55
GRAN PRIX		
SOFT LAW T&DIR	CLUDE	D
☐ VIP WRITER (INC. SPELLER!)		
□ VIP SPELLER		(DISK)
□ VIP CALC	\$55.95	

	COGNITEC T	D
	VIP DISK-ZAP\$39.95 VIP INTEGRATED LIBRARY\$119.95	
0	VIP DATA BASE\$47.95	(DISK)
7	VIP TERMINAL	

TELEWRITER	64.						٠				. \$	39	95		
THE RESERVE OF THE PARTY OF THE	THE PERSON NAMED IN	-											-	-	٠

ELITE SOFTWARE

ELITE-WORD/SPEL	\$59.95
ELITE-SPEL	. \$23 95
ELITE-CALC\$47.95	\$47.95
ELITE-FILE	\$59.60
ENTIRE LIBRARY (DISK)	. \$157.00
DEFT SYSTEMS T	D
DEFT PASCAL	. \$63.95

	PXE	COM	PU	TIP	1	3		т	D	
EFT	PASCAL	WORKE	BENC	H.				1 . 1 . 1	\$95.9	5
EFT	BENCH.								\$39.9	5
EFI	PASCAL								. \$63.9	5

I AL COMI OTHER		U
□ AUTOTERM	. \$31.95	\$39.95
(SEE PAGE 15 OF RAINROW)		

SPECIAL SALE! 30% OFF

PRICKLY-PEAR SOFTWARE

			_
*	MODEM MASTER		\$17.45
	SUPER SCROLL (64K)\$1	7.45	\$17.45
*	COLOR DISK TRIVIA		\$20.95
	BIBLE		\$13.95
	ENTERTAINMENT		\$13.95
	SPORTS		\$13.95
	CHILDREN	OCA 63 63	\$13.95
D	JUMBO JET\$1	7.45	\$20.95
D	MUSIC READER\$2	4.45	\$27.95
*	ERLAND\$1	7.45	\$20.95
D	TRAVELIN'TOAD\$1	7.45	\$20.95
D	OCKYWOKY\$1	7.45	\$20.95
D	ADVENTURE IN WONDERLAND\$1	7.45	\$20.95
	THE DISK MANAGER		\$20.95
	THE DISK MASTER		\$17.45
	COLORKIT (Programming Utility)\$2	4.45	\$27.95
	FLIGHT\$1	3.95	\$17.45

TOM MIX

	THE SAILORMAN (64K)\$23.95	\$27.95
•	PAC PANIC	\$22.35
	QUIX\$19.95	\$22.35
•	WORLDS OF FLIGHT\$23.95	\$26.35
	SKRAMBLE\$19.95	\$22.35
	SR-71\$23.15	\$25.55
	CU*BER\$22.35	\$24.75
	BUZZARD BAIT\$22.35	\$24.75
	AIR TRAFFIC CONTROLLER\$23.15	\$25.55
,	SPACE SHUTTLE \$23.15	\$25.55
	THE KING\$21.55	\$23.95
	COLOR GOLF\$14.35	
	TAPE TO DISK\$14.35	
	SCREEN PRINT ROUTINE \$15.95	\$17.55
	(Specify Printer DMP - EPSON - OKIDATA	1

ADVENTURE INTERNATIONAL

	T	D
* FIRE COPTER		
* SAIGON: THE FINAL DAYS	\$19.95	
* EARTHQUAKE		
* AIRLINE	\$19.95	
SEA DRAGON	\$27.95	
▶ TRIAD	\$27.95	
DISKEY (Utility To Examine And Cha	inge Disk C	contents

B5 SOFTWARE

Plus Computer Diagnostics).....\$39.95

	T	D
MONEY	\$15.95	
BORROW	\$15.95	
CARRY	\$15.95	
MATH FACT	\$13.55	
ABC'S	\$ 7.95	
ALL	\$64.00	

PROGRAMMERS INSTITUTE

	U
COMPLETE PERSONAL	
ACCOUNTANT - (1,2,&3)\$59.95	\$63.95

NOTE: ALL SALES FINAL, NO RETURNS UNLESS DEFECTIVE. ADDITIONAL LISTINGS IN OUR FREE CATALOG — CALL OR WRITE.

*Requires 16K Ext. Basic Minimum.

▶Requires 32K Ext. Basic Minimum. □We Recommend 32K or 64K.

Others 16K Ext. Std. Basic Minimum.

WE PAY SHIPPING TO U.S.A. CANADA AND MEXICO. C.O.D. ADD \$2.00 (U.S.A. ONLY). ALLOW 2 WEEKS

D

Computer Software And Accessories 2806-A S. MEMORIAL PARKWAY HUNTSVILLE, ALABAMA 35801

> VISIT OUR STORE PRICES IN AD ARE MAIL ORDER ONLY

PHONE ORDERS 205/536-4400

(PHONE OPEN 7 DAYS A WEEK)



WE PAY SHIPPING!



FOR CHECKS TO CLEAR. NO P.O. BOXES! MUST HAVE STREET ADDRESS. SHIPPING — OTHER COUNTRIES: ADD \$2.00 EACH SOFTWARE ITEM AND EACH JOYSTICK. ADD \$5.00 EACH ALL OTHER ITEMS (NO MONITORS OR PRINTERS SHIPPED OUTSIDE U.S.A., ITEMS ARE SHIPPED AIR MAIL, PRICES

SUBJECT TO CHANGE WITHOUT NOTICE

Music Library 200 And 300 Make Beautiful Tunes

Question: Does the availability of new hardware generate software, or does the availability of software generate hardware sales?

Speech Systems is not taking a chance when it comes to supporting their music-generating programs for the Color Computer. They have released two additional sets of musical libraries to support their *Musica 2* system.

Recent reviews in THE RAINBOW have covered *Musica* 2, the music composing program, and *Music Library* 100, the first release of musical compositions which were generated using the Color Computer. The release of *Music Library* 200 and 300 tremendously increases the amount of pre-recorded music which can be played on the CoCo, or modified if one has the *Musica* 2 program.

First, I will briefly review Musica 2 which was used to generate Music Library 200 and 300.

It allows you to create musical compositions with up to four-part harmony (four voices played at one time). The results are quite unlike anything you've ever heard using the SOUND and PLAY commands. The sound of the songs is quite electric, similar to the tones created by a Moog synthesizer, but also reminiscent of a harpsicord or a Wurlitzer band organ without the cymbals.

The Color Computer and *Musica 2* create the music by generating a stream of numbers that the CoCo converts to voltages through the sound port (six-bit digital-to-analog converter). By varying the numbers and then the voltages at the appropriate rate, a tone is produced through the TV speaker. Pitch is varied by skipping a certain number of values. This method of varying pitch makes it possible to produce more than one note at a time.

Musical notes are displayed on the standard treble and bass staffs as you create or edit them.

Music Library 200 and 300 does not contain the Musica 2 program. You cannot create or edit music with these programs, only play the selections contained on them.

Music Library 200 contains:

- Volume 11 More music from the '40s, '50s, '60s and '70s (39 minutes, 21 selections)
- Volume 12 More music from the '70s (43 minutes, 21 selections)
- Volume 13 More music from the '60s and '70s (43 minutes, 21 selections)
- Volume 14 More music from the '40s, '50s, '60s and '70s (34 minutes, 21 selections)
- Volume 15 The Beatles (37 minutes, 21 selections) (my personal favorite)

Music Library 300 consists of:

- Volume 16 Variety (39 minutes, 21 selections)
- Volume 17 Nostalgia (42 minutes, 22 selections)
- Volume 18 Richard Rodgers Song Book (39 minutes, 19 selections)
- Volume 19 More music from the movies (40 minutes, 23 selections)
- Volume 20 Music from the '60s, '70s and '80s (42 minutes, 15 selections)

Each of these musical libraries is available on either disk or tape. The disk version is more desirable as it displays a menu of the available titles and allows you to play any selection at random, or program a series of your own selections — like a jukebox — except you don't need any quarters.

The quality of the compositions range from OK to fantastic. Clark Rulaford, who composed (or transferred) these songs using *Musica 2*, obviously took extra time on a few to maximize the results using the capabilities of *Musica 2*. "Lady Madonna" and "Penny Lane," from the Beatles disk, are outstanding examples of the capabilities of *Musica 2*, but "Norwegian Wood," also on the Beatles disk, drags.

To maximize the tonal quality of the songs, it will be necessary to add either an external speaker to your TV or purchase the Speech Systems Stereo Pak accessory which redirects the output through your stereo. The small TV speakers just don't have the tonal range to do justice to the capabilities of the *Musica 2* system.

A word of warning: If you purchase any of the *Music Library* programs, you had better start a fund to set aside enough to purchase the *Musica 2* program, because after you've heard what music can be created with your CoCo, you will want to start creating your own.

(Speech Systems, 38W255 Deerpath Road, Batavia, IL 60510, 32K disk \$39.95 each, tape \$34.95 each.)

- Bruce Rothermel

RAM 16

PLUG IN MEMORY FOR YOUR COCO

Plug 16K memory into your CoCo cartridge slot. Absolutely no internal modifications are required. RAM-16 has low power drain because like your CoCo, RAM-16 contains reliable dynamic RAM memory.

Save your ROMPAK programs on tape and run them in the RAM-16. Reduce wear and tear on your CoCo connector and ROMPAKs. This also lets you modify your ROM based programs.

Using software provided with the RAM-16 you can run BASIC programs in the RAM-16 and use Color Computer memory for machine language or graphics memory. (16K CoCos with RAM-16 can run programs that require 16K mem for BASIC 12K for GRAPHICS pages (PCLEAR8) and still have 2.5K left for machine language subroutines.) Or load up to 16K of machine language programs in the RAM-16 and reserve all of main memory for basic or those large graphics programs.

Develop and test programs in a RAM environment before committing them to ROM or EPROM. WRITE PROTECT logic in the RAM-16 simulates true ROM operation.

RAM-16 uses a high quality glass/epoxy PC Board with GOLD contacts for RELIABLE operation and is packaged in a well made plastic case that is styled to match your Color Computer.

RAM-16 is designed specifically for the original Color Computer in the 4K, 16K or 32K memory size. (Gray Case Model). RAM-16 will operate with Color Basic or Extended Color Basic.

RAM-16 comes with a cassette tape containing a test program that tests all RAM-16 functions and a utility program that lets you use it with your basic programs.

RAM-16 comes with a complete Users Manual containing a circuit diagram and applications information.

Price \$129.95 (U.S.) plus \$5.00 (U.S.) Shipping and handling. (Ontario residents must include 7% prov sales tax.)

Send your check or money order to:

MICRO ACCESSORIES

P.O. Box 11009 Stn H

NEPEAN Ont. Canada. K2H 7T8
Color Computer is a trade mark of the Tandy Corporation

Screen+ Adds Variety To Your Text Screen

Screen+ is a machine language utility with several features. The color of the text screen as well as the characters on the screen may be changed to interesting, non-standard color combinations. The program does this while operating in a background mode with BASIC programs. The screen changes can be toggled from the keyboard or from within the program. Keyboard operation is achieved using the down-arrow key as a control key, while operation from within a program is best controlled by printing the appropriate CHR\$ as described in the instructions. Although the instructions say the keyboard commands can be used whenever INKEY or INPUT statements are active, I experienced erratic results when I tried this method. Better results are obtained when keyboard control is used before running the program.

The program also contains an auto-number routine for use in writing BASIC programs, a line list routine that will list a program to the screen line by line and an auto-repeat key function on all keys.

I found the screen commands to be of limited value. Each time any of the commands were called, the screen was cleared to the new command format. If a CLS is then used, the screen returns to the usual CoCo color. This makes it difficult to use this routine to enhance existing software as the screen usually ends up with some of each

NEED AN INEXPENSIVE SERIAL-PARALLEL INTERFACE?

SP-2 INTERFACE for EPSON PRINTERS:

- 300-19,200 BAUD rates
- Fits inside printer No AC Plugs
- Optional external switch (\$500 extra) frees parallel port for use with other computers
- **49**95 (plus \$300 shipping)

SP-3 INTERFACE for MOST OTHER PRINTERS:

- 300-19,200 BAUD rates
- External to printer No AC Plugs
- Built in modem/printer switch—no need for Y-cables or plugging/unplugging cables
- \$6495 (plus \$300 shipping)

Both also available for RS-232 and Apple IIC computers. Co Co Serial Cables 15 ft.—\$10. Co Co/RS-232 Cables 15 ft.—\$20. Other cables on request.

CN

P.O. Box 492 Piscataway, NJ 08854 (201) 752-0144

R ENGINEERING
DEALER INQUIRIES INVITED!

color present. This can make for some strange effects. When writing new programs, the screen effects available are more easily used and can give your software distinctive text presentation.

The other features of this program work well and make it easier to write your own programs. The auto-number routine can be set for any start number and any line increment. I find this feature helps my concentration when I am working on my latest "masterpiece" in code. The line list feature allows controlled scrolling through the listing to find just where that "lost" subroutine has gone. The key repeat feature is a mixed blessing; it's there whether you want it or not. I think it would be more helpful if this feature could be toggled on or off.

The instructions are supplied as a clearly printed two-page booklet photo-reduced to fit on one 8½ x 11-inch sheet. Loading instructions are explained and the necessary command lines for 16K and 32K computers are typed as they would appear on the screen. Instructions for use of the program features follows. The program is not copy protected, so backups are not a problem. The high quality cassette contains multiple copies, while the label contains the distributor's address and telephone number.

At the asking price of \$16.95, I think this is a useful program for anyone who does not want to invest in a more complete BASIC helper program, and as a bonus you get some unusual text screens to make your work stand out from the crowd.

(Dataman International, 420 Ferguson Ave. N., Hamilton, Ontario, Canada L814Y9. 16K or 32K, any BASIC, cassette \$16.95, disk \$20.95, U.S.; cassette \$19.95, disk \$23.95, CND.)

- Charles Bream

One-Liner Contest Winner . . .

Crazy Quilt generates just that; a crazy quilt of colors on the screen. The program draws filled boxes on the screen at random. Normally these would be white, but by POKEing a random value into 178, the boxes take on a certain texture and various colors.

The listing:

10 POKE65494,1:R=256:S=192:PMODE
4,1:PCLS:SCREEN1,1:A=RND(-TIMER)
:FOR N=0T0200:A=RND(R)-1:POKE178
,A:X=RND(R)-1:XT=RND(R)-1:Y=RND(S)-1:YT=RND(S)-1:LINE(X,Y)-(XT,Y)
T),PSET,BF:IK\$=INKEY\$:IF IK\$="E"
THEN POKE 65494,1:END ELSE NEXT
N:GOTO 10 'Crazy Quilt

Lee Veal Rowlett, TX

(For this winning one-liner contest entry, the author has been sent copies of both *The Rainbow Book Of Simulations* and its companion *Rainbow Simulations Tape.*)

Arithmetic Tutor Is A Good Practice Tool For Problem-Solving

Sometimes I view computer programs somewhat analogous to television programs. A great many of them (mostly games) are for entertainment only. These are the sitcoms, variety shows and soap operas of computerland. Applications (word processing, etc.) are similar to TV news programs. Finally, educational programs for computers can be compared to educational programs on television: some are great and some are very boring.

With this in mind, I looked at an educational offering from Computer Island called *Arithmetic Tutor*. This package is primarily made for a classroom environment and allows practice in multiplication, long division, factor operations and the hierarchy of operations. Significantly, the program provides feedback not only in a "number right" report, but also provides a diagnostic listing on various aspects of the operations needed to complete a problem. The teacher (or parent) can then help the child overcome his specific computation problems by checking out what problems continue to crop up on the report.

From a programming standpoint, Arithmetic Tutor is thoughtfully made. The student is lead step-by-step through the problem-solving process, and is prompted at every operation to tell what the next computation will be. I do have a criticism with Arithmetic Tutor in this area as the program seems to be more interested in computational skills than in process. That is, the program leads the student through the process basically asking, for example, "OK, now it is time to multiply; what is 8 times 7?" instead of "do I multiply or carry a number next?"

On the positive side, as with most good educational programs made for computers, the BREAK and CLEAR keys are disabled to prevent students from destroying records of other students' work that hasn't been saved to disk. *Arithmetic Tutor* also features a Help command to give the students aid if they run into a problem area. The program will automatically "help" students if they press ENTER without giving an answer. All this is recorded in the report area so the teacher can check what areas the student needs the most help in later.

Although each session will hold information on a class of only 15 to 17, the program will extend to hold more students if disk space is available. A password must be provided to reveal diagnostic information as well as to start a new session. One potential problem is no provision is made if students have the same name. One student may wipe out another's file if both are named "Ted," for example. The documentation suggests using a different name for one of the "Teds." My experience with children is that they are very proud of their names and they don't care to change it for anyone (including a computer)!

The most important test of any educational program is how well it works with its intended student. Here, I must get back to the television analogy. The best educational programs hold the student's attention while they continue to involve the viewer in some educational process. Here is where *Arithmetic Tutor* has a major

problem. After the initial interest in the program because of the computer gimmick, I found children quickly discover the program is mostly drill and practice with little reward and they lose interest. My daughter also complained that it was too hard to do the computations on the keyboard and video screen, and she soon resorted to paper, wondering why she was doing such problems on a computer, anyway. The answer, of course, is the diagnostic areas provided for the teacher. The teachers, when using this program, will have to be ready with some answers to these questions if they attempt to use the program in class.

A few questions are not answered in the documentation provided with the program. The author does not attempt to affiliate a grade level with the program. I suppose this is not important as far as the arithmetic portion (a teacher can use it when needed), but it is important for giving a teacher a clue as to the level of the written material (such as instructions to the student). The program is not protected, but there is no indication whether the teacher may make multiple copies if there is more than one computer in the classroom.

Educational software is so sorely needed for the Color Computer it is really hard to be critical when one is produced. I would much prefer my daughter to be using Arithmetic Tutor on the computer than playing another round of some Pac Man-type game. I fear, however, that as students have gotten bored with the "talking head" approach to television and television moved to much better programs, so it is with "practice" programs such as Arithmetic Tutor. Buy it as an alternative to games for your students or kids, but let's hope for a little more pizazz in education programs for the future.

(Computer Island, 227 Hampton Green, Staten Island, NY 10312, 32K disk \$49.95)

- Brian James

One-Liner Contest Winner . . .

You might call this one-liner a "one-worder." It asks you for a single word, a delay value and a screen location, then flashes the word you gave at the desired location, alternating between normal and inverse text.

The listing:

0 INPUT"INPUT POSITION, DELAY, W ORD";P,D,W\$:CLS:L=LEN(W\$):FORX=1 TOL:L\$=MID\$(W\$,X,1):N\$=CHR\$(ASC(L\$)+32):F\$=F\$+N\$:NEXT:FORX=1TO20 :PRINT@P,W\$;:FORY=1TOD:NEXT:PRIN T@P,F\$;:FORY=1TOD:NEXTY,X:CLS:RU N

> Kelly Weston Kansas City, MO

(For this winning one-liner contest entry, the author has been sent copies of both *The Rainhow Book Of Simulations* and its companion *Rainhow Simulations Tape.*)

Color Stat Strategy Baseball Is An Excellent Statistical Game

Color Stat Strategy Baseball is produced by Pinto Products. The program is on disk and requires a 32 Disk Extended BASIC system. The disk includes three programs which are listed as: CS, DF and LD.

CS is the actual baseball program. When you run it, you will be prompted to input the visiting team, then the home team. After each team is selected, the program automatically loads their statistics from the disk. Next, you will be required to select your batting order, then your pitchers. Now on with the show!

The screen will clear and the batting orders are shown as follows: 1-9 visitors, A-I home, then you input which batter is up and he will appear on the screen along with his statistics.

You have eight options from which to choose. 1) hit; 2) change; 3) sacrifice; 4) hit and run; 5) intentional walk; 6) steal; 7) squeeze play; and 8) infield, in/hold runner. The computer will check the batter stats against the pitcher stats and the results will be shown on the screen. The computer takes care of the plays and the outs. The Simulation continues for the rest of the game.

DF is a data file program which is used to create new teams and their statistics, which could be past, present or

ones you make up.

To establish a new data file, first you input the team name, then choose (b)atter or (p)itcher, change or input. You are then prompted with (Name AB, H, 2B, 3B, HR, SO, SR, RR), for example: Morgan 404, 93, 20, 1, 16, 54, 89, C, 16 then ENTER.

For pitchers, you are prompted for the following: IP, H, SO, BB, ER, HR, Won, Loss. After each player change or addition, you will be prompted (another pitcher Y/N), (another batter Y/N). If no, then the screen will clear and you will be asked to make a selection as follows: R-restart, N-restart and create new file, Q-quit, L-to run list data program.

LD is a list data program for reviewing or changing an existing data file, or printing out teams and stats.

Color Stat Strategy Baseball is a well-written program with very good documentation, but as a baseball buff, I see this more as an excellent statistical program than as a baseball game. It seems to be hard for an amateur baseballer to follow because: 1) no scoreboard; 2) the program does not tell who is on base; 3) if the inning changes, the same team can bat and 4) all scores and base runners are to be kept on a separate sheet. I feel if these points are corrected and inserted, this would be a more enthralling baseball game.

(Pinto Products, 718 Fiji Circle, Santa Ana, CA 92704, disk \$27.95 plus \$2.50 S/H)

- By Terry Brown



B-XREF Is A Good Utility For Any BASIC09 Programmer

Anyone who does much programming knows about cross-reference programs. They are utilities that take programs and create such niceties as a variable dictionary consisting of the location and type of variables, listings of those lines pointed to by other lines by GOTOs and GOSUBS, and other useful references. These programs are hard to come by, however, since they are complicated to write and demanded only by the more experienced of programmers.

Since BASIC09 is relatively new, many companies have not put much time or money into the development of such "risky" programs. Fortunately, for those of us who program in BASIC09, one company has. It is Interactive Micro Systems and their program is called B-XREF. This is an excellent program that can be used by anyone, from firsttime users to old hands at programming.

The operation of the program is extremely simple; simple enough, in fact, to warrant a one-page instruction sheet. On the fact-filled page there is a program description, installation procedure, general instructions, restrictions and a list of error messages.

Installation refers to placing the program where it can be used. This is simply to copy the program from the master disk onto your working disk. Nothing can be simpler than that. To invoke the program is only a few keystrokes more difficult than the installation. The command line that makes B-XREF go to work is: bxref [-f] [-w] [-l] in-file1 [in-file2 . . .] [>outfile] with the items in the square brackets being optional.

All of the options preceded with a dash are called switches. These allow for a customized output with as little extra work by the user as possible. The switches are as

- -f allows form feeds to be suppressed for use with printers which do not accept form feeds.
- -w creates a narrow report, as opposed to a wide one, which is especially useful for on-screen outputs.
- -1 will prevent the listing of the source procedure; otherwise the procedure is printed out before the crossreferencing information.

Another feature of B-XREF is that more than one procedure can be cross-referenced at a time; simply add the procedure name to the command line. In addition to multiple procedure names, the command line may have any valid output path. This allows for the output of the cross-reference to go to a file on disk, to the screen or to the printer.

B-XREF has only two obvious limitations, as is stated in the documentation: The utility should be used only on unpacked, error-free procedures. If, however, it is fed a procedure with a misspelled keyword, for example, there is a good chance B-XREF will help you find the mistake. The second restriction is there may be no more than 500 total references. This includes the use of a variable name, procedure name or line number. There is a note that if

the latter restriction is a problem, simply contact Interactive Micro Systems for help.

Any utility would not be complete without error messages. These are few in number (four) and cover problems in opening files, lack of available memory, or a full reference table. The messages are self-explanatory, but the documentation goes even further in explaining their meanings.

The output of the utility is clearly laid out. At the top of the page is the source listing of your procedure, unless prohibited by the -l switch. After that, the program starts listing all variables and procedure calls in alphabetical order. On the left-hand side of a line is the name of the variable, and on the right side is the type of variable: integer, string[20], procedure name, etc. On the next line appears the line in which the reference occurs. The source program lines need not be numbered, as in Disk BASIC, so when B-XREF lists the source code it includes line numbers of its own.

In general, I think B-XREF is a well-done utility which will be useful to any programmer who uses BASIC09. Perhaps it would be helpful to have the program cross line numbers as well as variables, but since BASIC09 does not require them, this is a trivial omission. If only there were more utilities such as this for other languages for the CoCo!

(Interactive Micro Systems, P.O. Box 21007, Columbus, OH 43221, disk \$19.95, plus \$2 S/H)

- Jim Sewell

History of the Color Computer 1982 1983 1984 1985 19 Months Since CoCo's Introduction 1986 With GRAFPLOT you can be a graphic artist! Get your point across by turning dull rows and columns of numbers into dazzling high resolution graphs. You'll never need to use graph paper, rulers or messy ink again. Improve your image and impress your boss! NO RISK! MONEY-BACK GUARANTEE! FREE R/S SCREENPRINT PROGRAM! * FULLY AUTOMATIC OPERATION! "A great package gets even better ... totally impressed ... equally useful in the home and office ... meticulous, hand-holding documentation ... very easy to use" RAINBOW, 6/84 & 7/83 "A high quality product ... slick presentations" Hot CoCo, 8/84 Universal Screenprint Loader for non-Radio Shack printers. Universal Screenprint Loader for non-Radio Shack printers. Full ASCII upper and lower case in 4 on-screen labels. Automatically scales and labels axes with "neat" tic marks. Full function data editing: add, change, delete and sort. Graphs and data output to screen, printer, tape or disk. Calculates user-defined functions, moving averages (binomial smoothing), cumulative totals and integrals (areas). Saves completed graphs for instant reloading. Works with all CoCo models - requires Extended BASIC. Disk Only: display or print directory, kill or rename files.

16K TAPE - \$35.00. 32K TAPE - \$40.00. 32K DISK - \$45.00 (US)

ASK YOUR DEALER FOR GRAFPLOT OR ORDER DIRECT FROM:

YOUR PERSONAL CHECK IS WELCOME! \$3.00 SHIPPING ON ALL ORDERS.

HAWKES RESEARCH SERVICES, 859 STANFORD AVE, DAKLAND, CA 94608

SHIPMENT WITHIN 48 HOURS! CA. RESIDENTS ADD SALES TAX.

Shiver Your Timbers With The Sailor Man

The 64K arcade games have finally arrived for the Color Computer and if the development of The Sailor Man by Tom Mix Software is any indication of things to come, our patience will have been well rewarded.

As the title suggests, the hero of this four-screen, actionpacked thriller bears a strong resemblance to the knobbykneed, swollen-wristed Popeye, whose zany exploits have long fascinated generations of Americans who love to pull for the good guys in white hats.

And true to form for Tom Mix, the CoCo version of this popular arcade game includes all of the features that have made it a hit, plus a few extras.

Loading is highlighted by a high resolution version of the Tom Mix logo, which is followed by a message asking the user to be a part of the software pirating solution by not making unauthorized copies of the program for friends. When the disk stops whirring, you are required to type in a common password supplied to all purchasers of the program. The procedure is a little confusing at first, but with a little practice, it comes easy.

After high scores from previous games are loaded (in the disk version), there's a color test to ensure that you are treated to the dazzling display of colors that are to follow.

SPECTRUM PROJECTS

Announces The Appointment Of **DERBY CITY SOFTWARE** As Spectrum's new

Southern Division Distributor

(AL, FL, GA, KY, LA, MS, NC, SC TN, TX, VA, WV) FIRST TIME ORDER SPECIAL

SOFTWARE — 10% OFF HARDWARE — 5% OFF

EXCLUSIVE DERBY CITY ITEMS

DISK SORT & ORDER

A disk utility that will eliminate all sectored data and alphabetize the directory. Also will allow the conversion of a RS-35 Diskette to a JDOS 40 track. One or more drives.

D-\$1195

CGP-115 PRINTER/PLOTTER UTILITIES

PP Color Dump — All machine language - fastest and highest quality screen dump for CGP-115 ANYWHERE Works in all PMODES and compatable with Graphicom. Many powerful and user friendly features.

T-\$1995 D-\$2195

PP Color BioRhythm — Prints out a four color one year BioRhythm. One month Page with both graph and daily codes fully color coded. D-\$1295

T-\$1095

GEMINI/EPSON Screen Dump

All machine language - full or quarter page pictures in less than 3 minutes. Works in PMODES 3 & 4 - Negative or Positive Compatible with Graphics. Positive Compatible with Graphicom

RS-232-C SERIAL PORT 2 POSITION SWITCH

\$19⁹⁵ Black Case v - just plug in

DERBY CITY SOFTWARE

4180 Bardstown Road Louisville, KY 40218

(502) 499-9393; In Canada call: 1-800-361-5155

All orders add \$3.00 shipping & handling KY residents add 5% sales tax C O D., VISA, MasterCard and Cash

On the first screen you dash madly about on four floors of play, negotiating eight different stairways while attempting to catch enough of Elsie's kisses (red hearts that float from the top of the screen) to fill in the 20 squares on the Sailor Man's house. As on all of the screens, you are vigorously pursued by none other than Bigfatbadguy who has his own ideas about who ought to be getting Elsie's favors. You're in danger of being eliminated until you can swallow a can of spinach, which will give you incredible power over your enemy. There's a punching bag at the top of the screen which, if your timing is exquisite, can send a bucket down onto Bigfatbadguy's head — a feat that will bring smiles to any onlookers.

The principle is the same on the second screen except that you are expected to catch musical notes. Oh, yes, there is the Olduglyseawoman who appears at higher difficulty levels to hurl empty bottles at you. You must punch them to avoid being bounced into the water. The objective is to catch enough notes to play Elsie a love song, which advances you to the third screen where you must collect enough letters (thrown by Elsie's cries for H-E-L-P) to build a ladder to the crow's nest where Elsie is trapped.

One of the real delights of the game is watching Bigfatbadguy sail through the air, bouncing off the left and right sides of the screen and then hearing the highly audible splash when he hits the water.

Adding interest are the various musical interludes between screens. You'll recognize and appreciate a fastmoving version of the Popeye theme song. However, if you tire of the music, press the 'M' key to toggle the music on and off.

By pressing the CLEAR key, you may select the number of players, the level of difficulty (from 1 to 9), the number of attempts, and the screen on which you wish to begin. Starting with any more men than three will prevent you from entering your name on the high-score table.

After a while you forget the novelty of playing a 64K game because the difference really isn't that noticeable, which actually says a lot about the quality of the games already on the market for the Color Computer. However, any feature you ever wanted in an arcade game is included in The Sailor Man.

(Tom Mix Software, 4285 Bradford N.E., Grand Rapids, MI 49505, tape \$29.95, disk \$34.95.)

Charles Springer



Preschool Pak Reinforces Letter And Number Recognition

Preschool Pak is a pair of programs designed for (who else?) preschoolers. Alphatalk promotes upper- and lowercase letter recognition. Countem drills in counting and number recognition. These programs are designed to utilize the Voice Pak by Spectrum Projects, but don't feel left out if you don't own one. Alphatalk and Countem work well without the voice.

In the program Alphatalk, the child matches letters on the screen with keys on the computer. When run, Alphatalk graphically displays on the screen a letter of the alphabet. It randomly chooses an upper- or lowercase letter. If you have the Voice Pak, the program will say the letter and wait for a response. If, after five seconds, no key has been pressed, the letter will be spoken again. If the wrong key is pressed, the letter will be spoken again and the program waits for the correct key. When the right key is pressed, a clown face appears, a snappy tune plays and the voice tells them they are correct. The next letter then appears.

The colors and graphics are nice in this program; even those kids who were old enough to know their alphabet forwards and backwards had fun with *Alphatalk*. My one criticism, though, is with the graphics. *Alphatalk* is all done in low resolution graphics. This makes the letters hard to read sometimes, particularly for those children who are not very familiar with lowercase letters.

Countem is a Hi-Res graphics program. When run, up to 10 interesting objects appear on the screen. They may be cars, birds, lamps, TVs or robots. The child counts the number of objects and presses the appropriate key. As in Alphatalk, Countem does not punish a wrong answer with noises or flashing displays, but simply waits for the correct response. When the right key is pressed, the screen changes to a pair of robot-like creatures who shoot a laser back and forth. There is a musical tune and a spoken reward. The next group of objects then appears on the screen. This program reinforces number recognition as well as counting skills.

Both of these programs are simple enough for preschoolers to play and enjoy without much adult intervention. Children as young as 3 and as old as 6 had fun with *Countem. Alphatalk* was enjoyed by all who were ready to learn both upper- and lowercase letters.

(Harmonycs, Inc., 1747 Patricia Lane, Salt Lake City, UT 84116, 16K cassette or 32K disk ECB \$15.95 plus \$2 S/H)

- James Ventling

See You At
RAINBOWfest CHICAGO
May 17-19

Grand Prix Rivals Arcade Version Of Auto Race Games

You expect the unexpected when you strap yourself into the Formula I in Intracolor's *Grand Prix*, but there's no way you could ever prepare for the hairpin turns.

You're zooming along, knowing the turns are ahead, but suddenly the track becomes a maze of stripes and your senses fail you. Your only option is to hit the brakes, let up on the throttle and hope for the best!

Among the recent auto race arcade games introduced for CoCo, *Grand Prix* is one of the more challenging. The graphics are excellent, although not comparable to MichTron's *Speed Racer*, in which the background competes strongly for your attention.

The dashboard is well designed, with gauges displaying the best time, the track number, lap number, miles per hour, gear and elapsed time. The steady hum of the Formula I adds a lot of realism to the program. You have the feeling that you're in for some serious competition.

When you're ready to begin, press the CLEAR key to select the desired track (there are five from which to choose). You may choose from either the keyboard or the joystick mode. If using joystick, just use the firebutton to shift gears. To accelerate, move the stick forward; to brake, pull the stick back. In the keyboard mode, the SHIFT key is used to shift gears. The up- and down-arrow keys are for acceleration and braking, the left- and right-arrow keys for steering.

The object is to score the lowest elapsed time for five laps in any one of the five different tracks. If you crash three times on one track, the game is over. When five laps are completed (a lot of practice runs will be required), your time is compared with the previous best time and you advance to the next track.

Grand Prix is another of those programs rivaling the quality of those many of us have longed for after visiting the neighborhood video arcade. It just goes to show that CoCo is capable of just about anything!

(Intracolor, P. O. Box 1035, East Lansing, MI 48823, tape \$34.95, disk \$34.95.)

- Charles Springer



DAMANA

305-484-7547

LIZPAC: An Extensive Statistical Analysis Package

By Frank J. Esser

A variety of statistical packages have existed for mainframe computers for quite some time. They are an invaluable aid to scientists and engineers, and give these people the ability to put observed data into some meaningful form and, quite often, display the results in graphical form. These packages offer a number of different routines or programs, and depending upon what the individual desires, dictate which of the routines he would use. Sometimes more than one routine will be found useful, and at other times, the data output from one may be fed into another to produce still another set of data. Whatever the desire of the user, the bottom line is that he has at his disposal a set of routines to help analyze data sets and reach a conclusion without the need for long and lengthy manual calculations. To anyone who has gone through such manual calculations, you know what a problem it can be.

What has all this got to do with LIZPAC and the Color Computer? Well, a statistical analysis package has come to the world of the Color Computer. Those of you interested in frequency distribution, regression analysis and so on, this is what LIZPAC is all about. I am not a whiz at statistics and cannot begin to determine if everything is present that would be desired. However, I can attest there is an awful lot offered by this package that should more than delight the heart of the user.

The programs come on eight 5½-inch diskettes — that is correct — there are eight diskettes full of programs and editors. The documentation is contained in a standard three-ring binder and consists of around 140 pages of instructions, and approximately 35 pages of printer listings of individual program runs. The last section contains the instructions for SHOWPACK 1.0 which will help create, label and edit Hi-Res graphics screen displays.

LIZPAC consists of 88 statistical and file management programs. LIZPAC programs are loaded by a single keystroke from the control program. Minimum requirements for LIZPAC are 32K of memory, Extended BASIC, a printer and at least a single disk drive. According to the documentation, LIZPAC can be used by individuals who have only a superficial knowledge of the use of computers.

See You At
RAINBOWfest CHICAGO
May 17-19

The excellent use of menus and screen prompts are enough so the user need not worry about data files, etc. Many of the programs ask if data files are to be constructed during the running of this program. The user is then prompted how to enter the data.

The documentation also states LIZPAC does not assume the user has an extensive knowledge of statistics. However, the user must be sufficiently familiar with the statistical process and terminology as to be able to provide appropriate responses to LIZPAC queries and prompts; if you don't know anything about statistics, this package is not for you. LIZPAC is written entirely in BASIC, and can be listed and modified should the user feel the urge to do so.

LIZPAC is broken down into five packages. The following is a brief description of each of those packages.

Package A — Core Package

Data File Administration — Has a complete editor for editing data files, utilities to perform sorting, merging, deleting from and adding to data files.

Descriptive Statistics — Consists of one-way frequency distribution, random sampling, theoretical frequency distribution, histogram and frequency polygon.

Comparison of Means — Comparison by t-test, Scheffe's test and Tukey's test; examination of means for polynomial trends; partitioned ANOVA tables and standard ANOVA tables.

Regression Analysis — Mass production of Pearson's "r's." Special packages for polynomial regression and exponential regression analysis.

Transformation of Variables — Performs variable transformation by incorporating user-written BASIC statements.

Showpack — Disk graphics package for editing and labeling *LIZPAC* graphs saved to diskette.

Datapack — Converts ASCII files to *LIZPAC* files or converts *LIZPAC* files to ASCII files.

Package B — Factor Analysis

Programs in this package provide for preparation of the raw data file and the correlation matrix, extraction of the principal components and estimating the principal factors by iteration. The rotation methods available are Quartimax, Varimax, Orthomax and the Direct Oblimin method.

Package C — Discriminant Analysis and Canonical Correlation

Performs a complete discriminant analysis and canonical correlation analysis, Geisser classification, and includes a program for one-way analysis of covariance with multiple covariants and multiple variables.

Package D — Cross-tabulation and Related Programs

Analysis of Cross Classifications — Program will perform a two-way analysis or will print a multidimensional table as a series of two-way tables.

Non-Parametric Statistics — Includes such tests and procedures as: Wilcoxen signed rank test; Hodges Lehmann estimate of the median; the Friedman two-layout and many more.

Package E — Time Series Analysis and Forecasting

Includes such forecasting techniques as ANOVA for trend and seasonal effects, plus much more.

Also included with *LIZPAC* are three utility programs which make using the analysis programs all that much easier. The utilities are EDITOR, DATAPACK and SHOWPACK. The editor will allow you to edit any of the data files created by the various programs. It is run from the main entry menu from which all the *LIZPAC* programs are run. When the editor is first started, it comes up in the ready state. Pressing the 'B' key will enable all the function keys used by this processor. All the commands are executed under the EDITOR via single keystrokes. The following is a list of the commands available and the control keys.

SHOWPACK is a program which will help create, label and edit Hi-Res graphics displays. Aids are provided for plotting data from tables, drawing with the joysticks, and creating pie charts and bar graphs. Graphs can be plotted using data tables stored on disk. It is loaded and run in the standard manner.

The LIZPAC package is quite impressive. The authors have gone through quite a bit of work to ensure the programs run as they should and have added some very nice utilities. The EDITOR is not a Telewriter-64, but is functional and does the job very nicely. SHOWPACK is another good example of the type of utilities that were added; it will let you plot your data on the screen in the Hi-Res mode. You can then label the charts, graphs, etc., however you want. The entire screen display can be saved

and, if so desired, can become a part of a slide presentation. The programs themselves are quite concise, and from the very simple tests I ran, straightforward to use. Every attempt has been made by the authors to make the programs usable by someone other than a computer expert. One nice feature of each data run is the ability to add to the output listing, the date of the run and the person performing the run. That appears on each printed output even if it goes to the disk.

I am not a statistician nor do I perform the type of data analysis in my everyday job that these programs provide, but I do know that *LIZPAC* is not for everyone. For those who need to perform data analysis of any kind, be it social studies, agricultural studies, scientific studies or any type of data manipulation, I think this is the set of programs for you. The only hard part is getting the data on the disk for processing. A utility called DATAPACK will take a *LIZPAC* file and convert it to an ASCII file or an ASCII file to a *LIZPAC* file. So if you have a terminal program and your data is on some other machine, you can dial into that machine, access the file, and *LIZPAC* will do the rest.

I like *LIZPAC*. It is well-done and the documentation, though not for the beginner, is also well-done. There are eight disks full of programs and sample data files. Again, this package is not for someone who does not have at least a good general background in statistics or data manipulating. It assumes a knowledge of certain skills is already present.

(Prickley-Pear Software, 86 Cherokee Shores, Northport, AL 35476, \$200 plus \$5 S/H)

TRS-80 COMPUTER DISCOUNTS



COLOR COMPUTERS

26-3134 16k color II	89.95
26-3136 16k ext color II	130.00
26-3127 64k color comp	185.00
26-3029 1st disk drive	289.95
26-1161 2nd disk drive	229.95

PRINTERS

26-1276 DMP 105	169.95
26-1271 DMP-110	299.95
26-1255 DMP-120	395.00
26-1257 DWP-210	500.00

MODEL 4 and 1000's

999.9
125.00
1020.00
1020.00
215.00
250.00

We Carry the Complete Line of TRS-80 Computer Products at Discount Prices CALL FOR A FREE PRICE LIST 800-257-5556 IN N.J. CALL 609-769-0551

WOODSTOWN ELECTRONICS

Rt. 40 E. WOODSTOWN, N.J. 08098

Be A Battleship Mate In *Talking Shiphunt*

If you're looking for a version of "Electronic Battleship" for the CoCo, your search is over. *Talking Shiphunt* is a strategic game requiring 32K Extended BASIC, one joystick and one player. For the best effect, Spectrum Project's *Voice Pak* with Del Software's *Translate* program should be used in conjunction with the program. *Shiphunt* can be played without voice, but it's much more interesting when CoCo talks to you.

A short instruction sheet is included which tells you how to load in the programs. *Shiphunt* is supplied on cassette, but can be easily saved to disk or another tape for a spare copy. Before loading, make sure the CoCo is off, then insert the *Voice Pak* cartridge. Next, CLOAD 'SHIPHUNT' and run it. You are then asked "Do you want me to talk?" If yes, put the *Translate* program into the cassette player and press 'Y' to load and execute. (*Translate* is the machine language text-to-speech program.) Before the game begins, instructions can be read and/or heard.

Game play is similar to the pegboard game "Battle-Ship." One big difference between the two is that the player does all the guessing in *Shiphunt* as to where the computer hides the ships. The player doesn't have ships of his own to deploy for CoCo to find. My attention span would have been longer if this capability was included.



Laneco Plaza

Clinton, NJ 08809

(201) 735-9560

Call or write for Price List

LOW PRICES ON 100% Radio Shack Equipment

(with full warranty)

Color Computers—

16K\$105	Drive 0\$275
16K Ext \$105	Drive 1\$220
64K\$180	DMP105\$170
	Prices include shipping.

Model 4 (2 disk, 64K)	\$1020
Model 4P	\$1020
Model 100, 8 K	
24K	. \$539
AND AFF DADIO OLIA OK COFT	MADE

20% OFF RADIO SHACK SOFTWARE

Prices subject to change

At the start, a 9 x 12-inch Hi-Res graphics grid is drawn on the left of your screen with 71 shots available. I prefer to use the keyboard to place the cursor in the spot I wish to fire upon. However, response time between the keystroke until the cursor moves from block to block is slow and can be aggravating. The right joystick must be plugged in so the cursor doesn't drift across the screen. It can also be used for movement, but the keyboard provides better control

The object is to sink all five of the computer's ships before your shots are gone. Five hits are needed to sink the battleship, four for the cruiser, three for the submarine, two for the destroyer, and one for the frigate. If you miss, a green bar appears in the block you last shot. Hits are displayed as yellow bars. Indicators at the right of the screen list how many ships, and which ones, have been hit or sunk, and how many shots are left.

Throughout the game, you can hear the captain giving orders to his crew: "You scrub the deck," "Load the cannon," and "Get ready to fire," are a few. The captain will also talk to you, saying things like "Please, can't we talk this over?" Sometimes it's hard to understand what is spoken, but if you turn the volume up and listen closely, the sentences make sense. Anytime during the game, hitting 'T' will turn the speech off. This will speed up execution of the program, but it's not as entertaining without speech.

There is no big finale at the end. When someone wins, a text display of the grid is flashed on the screen for a few seconds, which shows where the remaining ships (if any) are and what your score is.

Talking Shiphunt is a good game for the younger children and inexperienced game players who don't want a lot of action. If you plan to purchase it, make sure you first have the Voice Pak with Del Software's Translate program.

(JARB Software, 1636 D Avenue, Suite C, National City, CA 92050, cassette \$10.95)

- Darren Nye

One-Liner Contest Winner . . .

This program draws a tight spiral, paints in the gaps, changes screen modes and does it again. It's great for seeing how the PAINT command works.

The listing:

10 B=0:A=1:PMODE4,1:PCLS:FORR=1T 02:SCREEN1,B:FORI=1T091STEP4:CIR CLE(128,96),I,A:NEXT:COLORB:LINE (35,96)-(221,96),PSET:CIRCLE(128,96),93,A:PAINT(128,99),A,A:A=0: B=1:NEXTR:RUN

> Kevin Oberberger Sparks, NV

(For this winning one-liner contest entry, the author has been sent copies of both *The Rainbow Book Of Simulations* and its companion *Rainbow Simulations Tape.*)

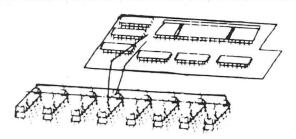
128K

THE EASY WAY

LOGIC BOARD FOR D, E, F VERSION OR COCO 2 (USA VERSION) *

ONLY \$109.95

INCLUDES ADDITIONAL 64K OF RAM



LOGIC BOARD WIITHOUT 64K RAM ONLY \$39.95

BUSINESS

DOOMINEOO	
VIPWRITER W/SPELLER	69.95
TELEWR!TER-64 TAP	E 49.95
DIS	K 59.95
PRO-COLOR-FILE	59.95
SMALL BUS. ACCOUNTING	89.96
ACCOUNTS RECIEVABLE	59.96
PAYROLL	69.96
DYNACALC	99.95
DYNAGRAPH	19.95
UTILITY FOR DYNACALC	
MASTER DESIGN	29.95
UTILITY FOR TELE-64	
SIDEWISE	39.90
SPREAD SHEET UTILITY	

HARDWARE

RHAPASODY CASSETTE	
RECORDER	24.95
M/D KEYBOARD	64.95
HJL KEYBOARD	79.99
M/D MONITOR INTERFACE	29.95
SERIAL/PARALLEL INTERFACE	* 59.95
LP VII/DMP 100 RIBBONS	6.95
32K WORDSTORE	199.77
PRINTER BUFFER	
EPSON/LEGEND RIBBONS	7.49
OKI/GEMINI PRINTER RIBBONS	
COLOR GEMINI RIBBONS	4.95
(RED, GREEN, BLUE, PURPLE & BR	(NWO
PERFECT DISK HEAD	
CLEANING KITS	19.95
MEMTEK MAINTENANCE KIT	19.95
SS/DD DISK (PKG. OF 10)	19.95
COLOR DISK (BOX OF 12)	24.95
DISK STORAGE BOX (HOLDS 1	0) 2.95

UTILITIES

FULL SCREEN EDITOR *	19.95
64K SPOOLER *	9.95
SUPER DISK/TAPE *	19.95
GRAPHIC SCREEN PRINT	9.95
SPECIFY PRINTER	

GAMES

GAME	3
SAILORMAN	TAPE 29.95
	DISK 34.95
DRACONIAN	TAPE 27.95
The same services and the same services are same services and the same services and the same services and the same services are same services	DISK 30.95
GRABBER	TAPE 27.95
	DISK 30.95
WORLDS OF	TAPE 29.95
FLIGHT	DISK 30.95
TREKBOER	TAPE 24.95
	DISK 27.95
SEAQUEST	TAPE 24.95
	DISK 27.95
SHENANIGANS	TAPE 24.95
	DISK 27.95
CALIXTO ISLAND	TAPE 24.95
	DISK 27.95
BLACKSANCTUM	TAPE 24.95
	DISK 27.95
VOCABULARY MGI	
SYSTEM	39.95

128K PROGRAMS

1 LOIK I IIO OII II III	
STAR DOS*	59.95
DRIVE 3*	24.95
128K BASIC MEMORY *	49.95
MANAGEMENT PROGF	RAM

APPLICATIONS

VIP WRITER TELEWRITER	TAPE DISK	
PRO COLOR FILE		59.95
SIDEWISE		19.95
DYNACALC		99.95
GRAPHICO M		29.95
AUTO TERM	TAPE	39.95
30 TOP 10 TO	DISK	49.95
DFT/TAPE		25.95
DFT/DISK		25.95
VIP TERMINAL		49.95
SUPER SCREEN	TAPE	25.95
	DISK	32.95
FHL O-PAK		34.95
SPECTRUM VOICE	PAK	69.95
TERM TALK	TAPE	39.95
	DISK	49.95
TALKING EDUCATION	JANC	24.95
TALKING FINAL COUN	MODT	124.95
TALKING SCORE-E		24.95
COMPUSERVE START	ERKIT	39.95

DSL COMPUTER PRODUCTS INC.



313-582-8930

P.O. BOX 1176 DEARBORN, MI 48121

Michigan Residents Add 4% Sales Tax to Order. Please include \$2.00 for S. & H.

In Canada you can order these items from:

R&R COMPUTER PRODUCTS P.O. BOX 354 STATION A WINDSOR, ONT. N9A 6K7 519-255-9113



Gamble Casino-Style With Bakersfield KENO

Anyone who has ever visited one of our gambling meccas has probably played keno. You can't help not playing it because it's everywhere; in the restaurants, lounges, the casino game areas, even in washrooms.

My favorite casino has a great \$3 steak and eggs breakfast in its dining hall. In the middle of the tables with the salt and pepper shakers are keno trays filled with forms and pencils. The roving game steward is only too happy to pick up your game ticket and bet at your table. That \$3 breakfast usually winds up costing a lot more after losing a number of keno games.

Bakersfield KENO comes on cassette and requires 32K Extended BASIC and is not copy-protected. After you run the program, your eyes are treated to a Hi-Res graphics display of numbered Ping-Pong balls bouncing around a glass jar, just like in the casinos. An attractive keno board fills the screen that serves as both the game ticket and the game board.

The program prompts you for the starting bankroll that cannot exceed \$1,000. The maximum bet allowable is \$9,999 or less, depending on how much you have left. The program keeps track of your bankroll, bets and payoffs.

Next, you pick how many numbers will be played with a choice of from one to 15. You can use the left-arrow key to go back and change a number before starting the actual game — a nice feature. The computer then selects 15 numbers at random and more times than not, they are not the numbers you picked (just like in the casinos)! I played over 100 games and only won once, which made me wonder if the game is rigged. This theory was quickly blown to shreds, however, when a friend of mine who does very well in casino keno won a lot more than I did using this program

When you run out of money or come very close to winning, any one of a number of humorous phrases is displayed, such as "CLOSE BUT NO CIGAR."

Bakersfield KENO can be considered to be both a home version of the game and a serious simulation of the real thing, except for one detail. Only one game card can be played per game. I would have liked to have been able to play several cards at once or play along with friends.

I could find no bugs in the program, and great care has been taken to reject incorrect user response.

The documentation consists of one typewritten page that is mainly a payoff chart with simple instructions to run the program. Even if you have never played keno before, the documentation is sufficient to get you going and understand all the features and options.

Bakersfield KENO is fun to play and is sure to please those who can't afford to drive to Reno every time the keno bug bites. Even though I kept on losing my bets, it was hard to stop playing (just like in the casinos)! Nothing else is required to use this fine program except the feeling that "Lady Luck" might be on your side today.

(Seibyte Software, P.O. Box 6464, Bakersfield, CA 93386, tape \$22.84)

- J. Michael Nowicki

BASIC COMPILER

MLBASIC 1.0 - BASIC COMPILER

WASATCHWARE is pleased to introduce what we feel is the most comprehensive BASIC Compiler available for the Color Computer. This BASIC compiler, called MLBASIC, is for programmers who want to create machine language from BASIC programs. Written in machine language, MLBASIC will prove to be the most powerful utility on your shelf.

COMMANDS SUPPORTED

1.	I/O -Comm	ands				
	CLOSE	CLOADM	CSAVEN	DIR	DRIVE	DSK1\$
	DSKO\$	FIELD	FILES	GET	INPUT	KILL
	LSET	OPEN	PRINT	PUT	RSET	
2.	Program C	ontrol C	ommands			
	CALL	END	EXEC	FOR	STEP	NEXT
	GOSUB	GOTO	İF	THEN	ELSE	ERROR
	ONGO	RETURN	STOP	SUBROU	TINE	
3.	Math Func	tions				
	ABS	ASC	ATN	COS	CNV	EOF
	EXP	FIX	INSTR	INT	LEN	LOG
	LOC	LOF	PEEK	POINT	PPOINT	RND
	SGN	SIN	SQR	TAN	TIMER	VAL
4.	String Fu	nctions				
	CHR\$	INKEYS	LEFTS	MID\$	MKNS	RIGHTS
	STR\$	STRINGS				
5.	Graphic/S	ound Com	mands			
	COLOR	CLS	CIRCLE	DRAW	LINE	PAINT
	PCLEAR	PCLS	PLAY	PMODE	PRESET	PSET
	RESET	SCREEN	SET	SOUND		

MASATCHWARE believes that the 6809 based microcomputer is powerful enough to warrant such a compiler. MLBASIC is a BASIC compiler that allows structured programs (using SUBBOUTINES), full floating point arithmetic and other features not available with Interpreter Basic programs.

Tape- \$69.95 Disk- \$69.95 Both- \$74.95 64K Required

64K Required WasatchWare

7350 Nutree Drive Salt Lake City, Utah 84121

Add \$4.00 Postage and Handling Call (801) 943-6263 Send check or Money order.

No C.O.D.. Utah res. add 5% tax.

One-Liner Contest Winner . . .

If you write machine language programs and have a printer, try this one-liner. It generates a chart on the printer of text screen memory locations in hexadecimal. (If you plan to make a batch of these charts in order to mark them up, you might consider doing it on a copier to save wear and tear on the printer.)

The listing:

1 CLS:PRINT" HEX SCREEN LOCATION S":PRINT" READY PRINTER (PRESS E NTER)":INPUT" READY";K\$:CLS:PRINT"WORKING....":PRINT#-2,CHR\$(27);CHR\$(20):C=0:FORX=1024T01535:C=C+1:PRINT#-2," ";HEX\$(X);:IFC=32THENPRINT#-2:PRINT#-2:C=0:NEXTEL SENEXT

Fred Furtado Springfield, VA

(For this winning one-liner contest entry, the author has been sent copies of both *The Rainbow Book Of Simulations* and its companion *Rainbow Simulations Tape.*)

TEXT Teaches Valuable Lesson In Word Processing

What could possibly be interesting about a program called *TEXT*? Is it something you read with or write with? It must be boring with a name like that.

That's what I thought. I was wrong! You're not going to be razzled and dazzled with lights and colors, but your child will receive a valuable lesson in a pre-word processing activity.

TEXT allows children to type, edit and format words and sentences on the video display. The letters are large and appropriately sized for young children. Each line holds 13 characters and each screen, seven lines. The program can hold up to three screens of information in memory. The cursor has four-way non-destructive control; text is not destroyed when the cursor is moved. Paging is controlled by placing the cursor in the bottom or top corner and pressing the right- or left-arrow key. When paging to the next screen, a brief waiting period is encountered while paging takes place. This wait would be inconsequential for small children.

What would a word processing program be without some filing and retrieving capabilities? *TEXT* has these, also. Pressing the SHIFT and left-arrow keys at the same time

invokes the utility menu. From this menu, saving and retrieving from disk or tape is possible. Printing the file is also an option on the utility menu. All printable keyboard characters are programmed into the *TEXT* program.

TEXT would be a valuable tool for schools and parents who desire an introduction to word processing for children. All the terms and conditions of a sophisticated word processing program can be introduced and demonstrated. Used properly, a child would benefit greatly from this program.

There are a few problems with the program that need to be addressed. The following enhancement suggestions would add to an already fine program. The program is written in BASIC and the BREAK key is not disabled. This is an absolute must for programs that are to be used by small children. No recovery procedures are built into the program. Another feature that would be nice is auto key repeat. This would provide an even more realistic word processing experience. One last enhancement would be improved documentation. If a program is to be used with young children, ideas and projects should be offered for the parent or teacher. TEXT documentation is one copied sheet with instructions.

In summary, *TEXT* is well-constructed and bug-free. It's a lesson for learning that should not be missed!

(Wish Software, P.O. Box 7366, Johnston, RI 02919, \$24.95)

- Rick Cobello

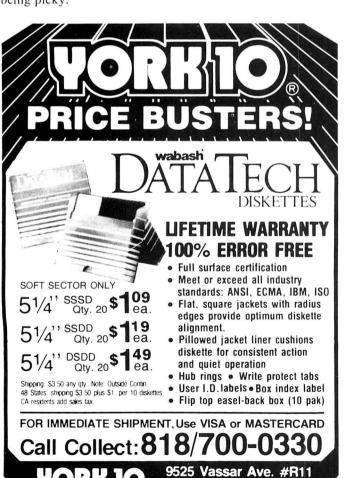


DATALIST Is A Good General Purpose Database

DATALIST is a database program written by Arlin Karger and distributed by Computer Associates, Inc. It is a cassette database written for the 32K ECB Color Computer that suits its purpose well. Among the things a computer does extremely well, given the proper software tools, is file, sort and format data. DATALIST does all this and more.

Among the database types is the File-Management System, which lets you create, save and retrieve records made up of fields into a file. Mailing lists are usually a specialized version of this type of database, and DATALIST is a general purpose database of this kind. The chief limitation of this type database is that you cannot merge information in one file with information in another file. You have to know what to put in the file, and prepare for it from the beginning. The File-Management System works very well for most purposes, and especially well with cassette-based systems.

DATALIST is clean and well-prepared. My one complaint is that the load procedure is a bit cumbersome. You must CLOAD ENTER, RUN ENTER and RUN ENTER. Looking at the code, I felt one of the RUN ENTER steps could have been eliminated, but considering all else, that's being picky.



There are three copies of DATALIST on the cassette, all of excellent quality. Each loaded cleanly on the first and subsequent passes. The manual is a clear and concise six pages, along with seven pages of descriptive tutorial. The tutorial takes the user through the creation of an address file — an expected and practical application.

Although the program is sold as being for a 32K ECB CoCo, I deliberately created a large file of 400 records, with 500 characters per record without problem in a 64K CoCo. It should be noted if you do manage to bomb the program, entering GOTO 1 will get you back in business with your data intact.

The function selections, all menu driven, are as follows:

- A) Add record permits the input of data, following prompts, within the specified fields.
- B) Delete record permits complete deletion of a record.
 - C) Edit record may be used to "Edit" any record.
- D) Sort permits the alphabetical sorting of any column within the file.
- E) Load file loads previously created files for printing, editing, search, etc.
- F) Save file saves all records for future use, including all field data.
- G) List a record list by selection, scroll up or down including wrap-around.
- H) Print reports this takes a little practice, but if it is in your file you can print it — alone or the whole thing.
- I) Print labels obviously for use with mailing lists, but not so limited for the creative mind.
- J) Select printer I like this feature a lot. Unless you "select" (turn on) your printer, data goes to the screen. The program is configured for the Epson MX/RX or Gemini-10. Option '0' will select the printer with no specialized commands for the Gemini or Epson.
- K) Set fields this is where all records begin. You can use this option only if 'E' or 'K' have not been previously
- L) Analyze a record this scrolls a record by fields. It is great for determining the location of a particular field within a record.
 - M) End ends the program.

If you have a cassette-based Color Computer, and can profit from the use of a good general purpose database (or just want to find out what databases are all about), I recommend DATALIST.

(Computer Associates, Inc., P.O. Box 683, West Fargo, ND 58078, cassette \$24.95)

Gary Smith

7.95

9.95

ANALOG TO DIGITAL CONVERTERS FOR COLOR 1 OR 2 COMPUTERS

- CCAD-B -

FEATURES:

- MENU DRIVEN SOFTWARE
- 12 BIT RESOLUTION
- 16 INPUT CHANNELS
- ON-BOARD USER **AMPLIFIERS**
- 3 TTL ALARM LINES DISK OR TAPE SOFTWARE INCLUDED

ORDER CCAD-B & DISKETTE

CCAD-B & TAPE

\$199.00 \$190.00

8 BIT RESOLUTION

FEATURES.

• 8 INPUT CHANNELS OPTIONAL MENU DRIVEN

- AD-8 -

SOFTWARE ORDER

AD-8 HARDWARE \$69.95 AD-8 TAPE AD-8 DISKETTE

> THINC-~~ P.O. BOX 3609 FULLERTON, CA 92634

Chatsworth, CA 91311

BBS Log Book Can Help You Get Organized

With the ever increasing popularity of long distance Bulletin Board Systems (BBSs), it becomes more and more difficult to keep track of which systems are available and what is required to access each of them. The BBS Log Book is designed to help solve many of these problems.

The book, which is 75 pages long, has a cardboard cover and is bound with plastic binding. Four pages of instructions are provided, even though the book is fairly self-explanatory. It contains three sections designed to cover most telecommunications needs.

The first section, called the "BBS Log," contains 50 pages of charts with headings for the BBS name, telephone number, optimum Baud rate, password, date, time on/off, messages received, uploads/downloads and special notes.

The "Personal Directory," which is printed on a cardboard divider in the middle of the book, contains room for 26 services such as CompuServe or The Source, and packet switching networks such as Telenet and Tymnet. Each service has columns for name, telephone number, customer service number, account number, password, network ID, control codes and optimum Baud rate.

Finally, the last section, called the "Telephone Log," is

25 pages long and is designed to help you organize your phone bill. Columns are provided for the date of the call, area code, telephone number, phone company name, destination, time on/off and total cost.

In actual use I found a couple of problems with the BBS Log Book. First and foremost, I found it hard to train myself to make entries into the book everytime I called a board. Without consistent use, the BBS Log Book is practically worthless. Secondly, I found the provided spaces much too small for practical applications. In most cases, I simply used two or even three lines to take notes on the boards' activities. Finally, there is no place to store your passwords to frequently-called systems. The author states that the "password" column "allows you to change your password with each call if you wish." However, when you call a particular board, you are going to have to search backwards through your log until you find your most recent password — hardly an efficient process if you call many boards.

Who would benefit from this book? I would only recommend it to people who are serious and frequent bulletin board users, and thus would benefit from the added organization. However, at \$5.95 per copy, almost anyone can afford to buy BBS Log Book to see if it suits his or her personal needs.

(Atmospheres, 1207 Eighth Ave., Brooklyn, NY 11215, \$5.95)

- Robert French

The KEY-264K is here!!

DO YOU HAVE A 64K SYSTEM (OR 32K WITH 64K MEMORY CHIPS) ?? ARE YOU BEING TOLD YOU CAN ONLY USE 32K FROM BASIC ??

DON'T BELIEVE IT !! - KEY COLOR SOFTWARE brings you the KEY-264K. An exciting NEW SOFTWARE utility that allows any STANDARD 64K OR 32K COLOR COMPUTER TO ACCESS 64K RAM FROM BASIC, and with NO HARDWARE MODIFICATIONS REQUIRED!!

*** Works with CASSETTE based systems! ***

*** Works with DISK based systems! ***

The KEY-264K divides the 64K ram memory into two 32K banks or sides, each of which can be utilized independently by the BASIC interpreter, with the ability to switch instantly from one side to the other. IT'S LIKE HAVING TWO COMPUTERS IN ONE!! Have your BASIC program on one side and keep your variables on the other side, or have your main program on one side and your subroutines on the other side, or have your program on one side and use the other side for 4 additional HI-RES pages, or any combination you like. The possibilities are endless because the KEY-264K allows full communication between sides plus the ability to switch back and forth at will, all from within BASIC. You could also have different programs in each side and switch back and forth between them using simple keystrokes, even while the programs are running!! Or run them both at the same time in the FOREGROUND/BACKGROUND MULTI-TASKING mode. Don't buy that printer buffer yet! With the KEY-264K you can be printing in the background side while utilizing your computer normally in the foreground side AT THE SAME TIME!!! Debugging a program? Ose either a BASIC command or simple keystrokes to instantly duplicate your program, in it's present status, on the opposite side. Switch to the opposite side later and pick up exactly where you were before!

For DISK users, the <u>KEY-264K</u> allows you to alternate between DISK and EXTENDED BASIC on the same side with simple keystrokes. No need to pull your controller or power down. You can be in EXTENDED BASIC on one side and in DISK BASIC on the other side and still switch back and forth and have full communications between the two sides.

The KEY-264K does this and MORE thru extensions to BASIC. No need to learn a new language! The KEY-264K adds 15 NEA COMMANDS and 1 function to BASIC, including powerful new BLOCK MEMORY MOVE and GRAPHICS VIEWING commands.

The KEY-264K works on the 64K COCO or 64K COCO-2 and on older 32K systems with "E", "F", or even modified "D" boards and requires EXTENDED or DISK BASIC with GOOD 64K MEMORY CHIPS!

ORDER YOUR KEY-264K TODAY by sending check or money order for \$39.95 (cassette) or \$44.95 (disk) plus \$2.00 postage U.S.A. (\$5.00 outside U.S.A.) Mass. residents add 5% sales tax.

MASTERCARD, VISA, OR COD CALL (617) 779-5034 KEY COLOR SOFTWARE P.O. BOX 360 HARVARD, MA. 01451



Take A Break With Pause Control Switch

For a CoCo hardware review, this is quite brief, because there is really not much to tell, which is probably appropriate for a "Pause Control."

Pause Control Switch consists of about \$2 worth of parts and a one-page instruction sheet. You really do not need more. The parts include an SPST toggle switch, two miniclips and about nine inches of paired leads connecting the switch to the clips. It is all assembled, and the quality of the soldering and dressing was quite good on the set I reviewed.

You will have to open your CoCo to install Pause Control Switch, and you are properly warned about how this affects your warranty. Once the case is opened, all you do is mount the switch through the cover (you could string it through the back if you didn't want to punch a hole in your computer), and clip the two leads to two well-exposed and safe leads on the ROM-Pak Interface. Thanks to the clips, no soldering is required.

What you have done is tied, in a way, to switch on a "halt" signal to the MC6809E microprocessor any time you want the computer to stop dead in its tracks. Halt forces all the VDG address lines into a high impedance state (engineers call it high-z). The computer is essentially stopped, waiting for direct memory access to drive it. Of

Canadians

Can you imagine it? It's free



Send for your free copy of our catalog/newsletter. It will contain articles, rumors and letters of interest to all Canadians. We stock all of the latest products available for the color computer, and the best news is that it will usually cost you less than importing from the United States. Kelly Software is Canada's largest distributor of CoCo Software.

Dealer inquiries invited.

Kelly Software Distributors Ltd.

P.O. Box 11932 Edmonton, Alberta T5J-3L1

Telephone (403) 421-8003.

course, none will, so the only effect as far as you are concerned is that the computer is stopped — literally frozen at the end of its last clock cycle! By the way, this hard stop will, in no way, harm your CoCo.

What does this do for you? You could pause in the middle of an action game, catch your breath, and resume like nothing had ever happened. This seemed important enough for one video game maker to use a similar halt as their prime advertisement. You could halt directory listings from disks. (Now, that had to make a few of you pause!) See how well it was named?

Computer security? Sure. With the switch on, applying power will get you a screen of graphics and nothing else. Pause Control does nothing if you are inputting with a cassette. Also, you can't pause the analog signal in; otherwise, you can pause the computer in the middle of just about anything!

(The Data'Phile, 207 Melrose Drive, North Syracuse, NY 13212, \$14.95)

- Gary Smith

WANTED!

Young men and women seeking adventure, excitement and thrill-a-minute action. No experience necessary—just you and your Color Computer. See below:

FOR THE 32K THRILLSEEKER

	TITLE	DISK	CASS.
NEW!	MR. DIG	\$27.95	\$25.95
NEW!	CANDY CO.	29.95	29.95
NEW!	WILLIE'S WAREHOUSE	29.95	29.95
NEW!	ICE HOCKEY		21.95
	ZAXXON	29.95	
	PROTECTOR II		29.95
	DESERT PATROL		21.95
	ICEMASTER		21.95
	FOODWAR		22.95
	WACKY FOOD		19.95
	CASHMAN		24.95
	CHOPPER STRIKE		24.95
	TIME BANDIT		24.95
	LOTS OF DLAY FO	D 461/	

LOTS OF PLAY FOR 16K

MOONSHUTTLE		\$26.95
FROG TREK	16.95	14.95
3-D TIC-TAC-TOE	18.95	16.95

Interested applicants send check or m/o to: OELRICH PUBLICATIONS, INC.

4040 N. NASHVILLE CHICAGO, IL 60634

Credit card orders call: 800-621-0105 (In Illinois call: 312-545-9286) NO SHIPPING CHARGES!!!

Shrinx Is An Exceptional Graphics Programming Tool

Shrinx is a utility program that supplements the Graphicom program. Graphicom is a very powerful and popular high resolution graphics program for the CoCo. (For information on Graphicom see THE RAINBOW, April 1984.) Shrinx requires a 32K CoCo and one disk drive. Use of up to four drives is supported by Shrinx.

A small, well laid out operators manual accompanies the *Shrinx* disk. Using the *Shrinx* manual, the program was up and running quickly. I found one small problem in the boot portion of the manual, it states: "Put the disk that came with this manual into drive 0. Type *Shrinx* and push the ENTER key. Drive 0 will start and you will be greeted with the *Shrinx* menu." This did not work using the standard Disk BASIC. I had to type: RUN' 'SHRINX'' then press ENTER.

Following is a list of Shrinx commands:

? = Disk Directory — Typing a "?" will list all the binary files on the disk drive currently being used.

M = Menu — Pressing 'M' causes the *Shrinx* menu to appear.

L = Load — Typing 'L' allows you to load binary picture files from a Radio Shack formatted disk.

W = Write — Pushing 'W' permits you to write a picture to a Radio Shack formatted disk.

D = Drive — Typing 'D' allows you to change the drive that is currently being accessed by the Load, Write and Disk Directory commands.

E = Enlarge — The Enlarge function divides the screen into four quadrants. After typing 'E' you are asked which quadrant to enlarge. The quadrant selected is redrawn to cover the entire screen.

S = Shrink — Pressing 'S' scales the original picture into four quarter-frame pictures by deleting horizontal and vertical lines. Each quarter-frame picture is unique because different lines are removed from each frame.

V = Variable Shrink — You can scale a picture to a desired size using the Variable Shrink function.

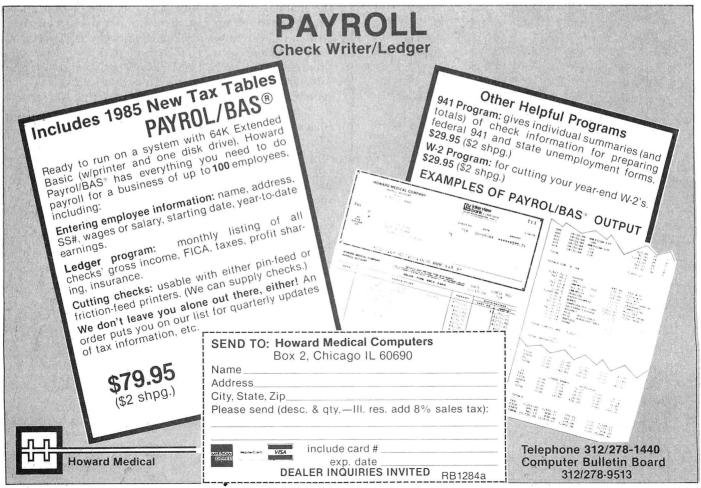
T = Transfer — The Transfer function allows you to save a picture to a *Graphicom* picture disk.

G = Get — Using the Get command permits you to load a picture from a *Graphicom* picture disk.

The *Shrinx* command structure allows you to easily transfer pictures from Radio Shack formatted disks to *Graphicom* picture disks and vice versa. I found the *Shrinx* program very user friendly. When used in conjunction with *Graphicom*, *Shrinx* can be an exceptional tool for the programmer, artist and/or novice.

(GRAFX, P.O. Box 254, West Mifflin, PA 15122-0254, Disk \$29.95 plus \$2 S/H)

- Gabriel Weaver

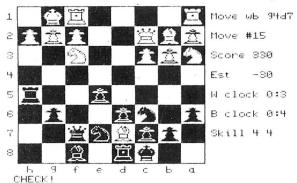


T/S EDIT And TRSCOPY Make Editing Effortless

If you have not used a full-screen editing program, you do not know how easy you could have it. Radio Shack has released T/S EDIT, a program that makes editing programs a lot easier than using the EDIT command. The first thing you notice when you open the package is that there are two disks. Radio Shack supplies a Disk BASIC version and an OS-9 version in the same package. Besides the two diskettes in the package, a well-written instruction manual is also included. The Disk BASIC version of T/S EDIT requires a minimum system of 32K RAM and one disk drive; the OS-9 version requires the OS-9 Operating System, 64K RAM and one disk drive. A notice in the manual states that T/S EDIT will run only on the Color Computer; it will not work on an auxiliary terminal. One other thing, all OS-9 users with the 01.00.00 version will have to make a patch before using T/S EDIT. The manual very clearly directs you through the patch, even if you have just started with OS-9 and are not really familiar with the system.

The manual walks you through an example. At first it was hard to get accustomed to the command functions, but with a little practice, it became easier. I did have trouble using some of the cursor movement commands, and a call to the local Radio Shack did not provide much help since

CHESSD™: A REAL Co Co Chess Program



High resolution display
High quality play
Variable skills levels
Plays Black or White
Can act as referee
Accepts Algebraic-like notation
Handles and plays special moves
Castle, En Passant, Pawn Promote
Tournament/Rapid Transit Modes
Tournament timer logic built-in
32,000 move disk opening book
\$49.95 +\$2.00 shipping/handling
Visa and Master Charge accepted.

Requires Color Computer with 64K and at least one disk drive.

Also available: SDOS®, BASIC Compiler, Word Processing



COMPUTER SYSTEMS DISTRIBUTORS P.O. Box 9769 Anaheim, California 92802 (714) 772-1390

*SDOS is a registered trademark of Software Dynamics *CHESSD is a trademark of Software Dynamics

they had not received a copy of *T/S EDIT* yet. A call to Texas proved to be only a little better; there are a few "bugs" in the disk I received to review. I had trouble using the lowercase command functions, but I was assured these would be corrected in the marketed version.

Some features included in T/S EDIT are full-screen editing, true lowercase letters, side scrolling, variable character display size, global editing and multiple file merging. A Hi-Res screen is employed in both versions of T/S EDIT. You have 10 different display modes to choose from. These vary from 32 x 16 to 80 x 32. You also have the option of 32 columns being Hi-Res and/or virtual 80 columns with horizontal scrolling. This means you get a 32-column, Hi-Res window with text entered into an 80-column line.

T/S EDIT has a "search and replace" routine that makes you wonder how you got along without it. It makes it very easy to edit a program, i.e., change the output to go to the printer instead of the screen. With just one line, you can replace all PRINTS to PRINT#-2s.

One other command I found very useful was the "Yanking" command. With this, you can move parts of a program from one location to another without deleting the original text. This is good to use when you use the same type of loop in your programming. Auto key repeat is used in the Disk BASIC version, but unfortunately it is not available in the OS-9 version.

If you do not have a full-screen editing program, you should consider Radio Shack's version before you decide on one. It is a good version with an excellent instruction manual. The manual's last three pages are a glossary of the *T/S EDIT* commands, and after you initially go through the manual, the last three pages should be all you will need. The program together with its documentation is written to be used by even the inexperienced programmer.

Also included in my reviewing package was another program called TRSCOPY. TRSCOPY is used to transfer Disk BASIC text files to OS-9 files and vice versa. It also requires the OS-9 Operating System, 64K RAM and one disk drive. It has a very small manual, at least by Radio Shack's standards, but it is definitely all you will need. The transfer is both fast and painless. You may transfer both text files and programs saved as ASCII files from one operating system to the other, however, TRSCOPY moves the files without modification; control and other special characters are copied, but not translated. If you copy a BASIC09 program from OS-9 to Disk BASIC, it will appear as an ASCII file on the disk. You will have to edit it with a full-screen editor or a word processor to. at least, remove the PROCEDURE line at the top of the program.

Again, if you do not already own a full-screen editor or a *TRSCOPY*-type program, these programs deserve your attention. Radio Shack did a good job developing *T/S EDIT* and *TRSCOPY* and more support seems to be around the corner. If you do a lot of debugging, but are not sure you need these programs, then a stop at your local Radio Shack for a demonstration may be in order.

(Radio Shack stores nationwide, *T/S EDIT*, disk \$34.95; *TRSCOPY*, disk \$24.95)

- Dale Shell

Omega File: Good Management System With A Price To Match

By Robert Foiles

Omega File is a single disk-based file management system which does not require 64K and allows the user to handle files with records in one file as large as 4,080 characters. Just so we are all talking about the same thing, a record is a group of data arranged in data fields or lines, and a file is a collection of these records.

This program is designed to permit the user to create individualized records with up to 16 data fields and each field may be constructed to hold from one to 255 characters. Since this is a single disk system, the number of records that can be handled by the program is dependent upon the size and number of fields selected for each record. For example, if the user wishes to create a file with records which each use the maximum 16 fields and each field at the maximum of 255 characters long, then this file would be limited to only 37 records. But, a file with records limited to 10 fields of 20 characters each would allow for about 780 records. The actual file size (e.g., number of records in the file) is limited by the storage space available on the disk in use.

The program allows for sorting of records and a "sort file" is created. Thus, if the user plans to store close to the maximum number of records on a single disk, some planning is needed to leave room on the disk for the sort file. The user might store several small files, with sort files for each, on the same disk with a little planning. However, should it happen that the user didn't do the homework, the program will flash the "Disk storage is getting low!" message on the screen before more data can be entered.

The hardest part of creating a file is the thought that needs to be put into deciding what the records should hold. To get to the task of structuring records for a file, select the Create option from the File Maker Menu. As noted, each record may have up to 16 data fields and each of those fields is to be labeled (up to 10 characters long). The user also sets the length of the data field (up to 255 maximum). In effect, this creates a template for each record to be in the file.

After the form is designed, it is just a matter of typing in the proper information for each record to construct the file. The program author has provided several good examples to follow in setting up the record format and also has provided several worksheets in the back of the manual to facilitate formatting a file.

When the user completes the designing of the record format or wishes to abort the efforts by hitting the '@' key, the program returns to the main menu. From the main menu, the user now has the choice of "using" a file and, once the title is entered, the File Maintenance Menu appears.

To speed up operations of the program, the program author has used the INKEY\$ mode, which jumps the program to the next line or option when the designated number of characters is reached or ENTER is hit. After the first

RESET-POWER-SWITCHES A REAL IMPROVEMENT

Move the power switch and reset switch where they belong. An LED power on light too! High quality parts. D, E boards and CoCo 2 totally solderless kit. F board requires soldering.

Reset 1 CoCo 1 \$24.95 Reset 2 CoCo 2 \$27.95

Either kit add \$2.00 shipping and handling



SAM DIAMOND, P.I.

The first of our new Sam Diamond graphic adventures. More than 30 detailed high resolution graphic scenes. A killer is loose in the city. Can you bring him to justice before he gets you? Excellent graphics and a tough mystery to solve.

32K EXB Disk Only \$29.95 plus \$2.00 shipping and handling



THE COCO-SWITCHER A QUALITY PIECE OF HARDWARE

The CoCo Switcher allows you to hook up three peripherals to your RS-232 jack. Connect your modem, printer and any other RS-232 compatible peripheral to the CoCo Switcher. An LED on the CoCo Switcher shows if your computer is on or off at a glance. The LED flickers when transmitting or receiving data.

Dimensions: $2\frac{1}{2}$ '' (64 mm) x 4'' (102 mm) x 5 7/8'' (150 mm) \$39.95 plus \$2.00 shipping and handling



MORETON BAY SOFTWARE

A Division of Moreton Bay Laboratory





316 CASTILLO STREET SANTA BARBARA, CALIFORNIA 93101 (805) 962-3127 eight characters of a filename are entered, the program goes right to the Field Maintenance or working menu. Also, while entering the data into the data fields of the records, when the designated number of characters is reached for that field, the program jumps to the next data field. This is fast, but it can cause problems for an inattentive user. However, the user may go into the Change option and correct the error.

At least one problem the user does not have to worry about is the saving to disk of the data. The program takes care of saving to disk as is needed. (But be careful: Upon ending the session, when the program asks if you want to "Save file," answer 'Y' or the program will kill all the records in the file!)

Another speed up method in the program allows the user to repeat an entry in succeeding records by hitting the '@' key while in the data field. The data field will automatically be filled with the information located in the same data field of the preceding record. Repetitive entries are a snap.

The Maintenance Menu now provides the option of either adding records to the file, changing information in individual records, viewing records in sequential order, or calling up a single record by its record number. If desired, deleting any record is possible; however, the record is not actually removed from the file, rather the first line of data is replaced by an '@' and the rest of the data fields are blanked. It appears that once a record is created and then "deleted," it still takes up space in the file and this space cannot be used again. Thus, the user should think about using the Change option to save storage space on the disk.

The Sort option can be used on any one data field within



a record, and the line or data field selected will be used as the key for an ascending order "sort file." Only one sort file per file is accepted by the program. If the user changes the sort field, the program will overwrite the old sort file. As noted earlier, if a file is getting close to the maximum number of records the disk can store, there may not be room for a sort file and a DF Error will occur causing the program to hang up. However, several short files with sort files can be on the same disk, depending on storage requirements of each file. The size of the sort file is directly related to the number of records in the file being sorted as the program lists the order of the records by their record number in this sort file.

The last option in the Maintenance Menu is the Print routine. All printing functions are set to the CoCo default 600 Baud. However, the user has the option of printing to an 80- or 132-column printer.

The output to the printer allows for many configurations. The user may select to have the material printed with or without a heading, with or without records' numbers, all or only some of the data fields, everything printed one line under the other, or each data field following horizontally. The program also provides for a printing of only those records that match the first 25 character string in a selected data field. The user may also decide margins, both top and bottom, and the number of lines between each record. The order in which the data fields are printed out is up to the user. The records may be printed out from the file as they were entered or printed out from the sorted file. Once a print format is set, all the variables are stored by the program. If the user wishes to change any of the optional ways of printing out the file, the program provides that option, too!

The program's biggest drawback is the type used to print the manual: It is a very condensed type (print size one might expect on a legal form!). The material is presented in a logical order and includes samples to follow to get a user started. It would have been helpful if the program author had included information on how to figure the amount of disk storage required by the record size and number of records. It would be even nicer if the program would read the disk and then, based on the record size designed, display on the screen the approximate number of records which might be stored on that disk.

The program makes use of sound to assist the user in the print option, but the use of a beep when the INKEY\$ mode jumps to the next line would be very helpful. If the user were copying data from a list and not watching the screen all the time, the sound would be an alert of the line jump. Also, the use of sound with the "Disk storage is getting low!" message would be helpful or better yet, at least keep the message on screen until the user hits ENTER again. Should the maximum disk storage space be reached and the user does not see the message, the DF Error may occur and the program crashes. As noted earlier, if the size of the record is small, the maximum storage space may never be a problem. One option some other systems have, which would be a nice enhancement, is the "Reverse at Comma" option.

A manual printed in a more user-friendly type size and a few more "beeps" at the right time would be the only improvements needed to make this excellent program even better.

(The Other Guy's Software, 875 South Main, Logan, UT 84321, disk \$14.95 plus \$2.50 S/H)

Announcement from Moreton Bay Software and Double Density Software:

To continue to provide you with fast service, technical support and to develop new and better products, Moreton Bay and Double Density Software are combining their marketing efforts. Now you can order any product from Moreton Bay or Double Density with one simple call. The fine programmers at Double Density will be able to devote full time to what they like best, developing new software and hardware for our customers.

UTILITIES FOR HOME AND OFFICE

COLOR TERM + PLUS +

The leader in communications software. Now version 5.0 is available! Just about every feature you could imagine for a terminal program. Communication BAUD rate: 110-4800. Printer BAUD rate 600-9600. Menu Driven. High resolution screen of 42, 51, 64 or 85 characters per line by 24 lines. Scroll protect up to 9 lines for important information. A 64K machine can have 53,000 characters in the storage buffer. Print any page in the buffer. Select half, full duplex or Echo. Select Odd, Even, Mark, Space or No Parity. Multiple screen formats in regular or reverse video. Compatible with all Radio Shack Color Computers.

Tape or Disk \$49.95

DOUBLE SPOOLER

Great utility! Let your CoCo do two things at once. List a program while you edit. Print data while doing calculations or data input. Keep two BASIC programs in memory at the same time. Requires 32K minimum.

Tape or Disk \$21.95

MORE BUSINESS

Ver 3.12 The preferred business package. Completely interactive. General Ledger. Accounts Receivable. Accounts Payable. Customer Statements. Mailing Labels, Profit/Loss. Balance Sheet Statements. Our most powerful business package. Buy the best!

32K Disk R/S DOS \$99.95

DOUBLE DRIVER

The BEST monitor driver available. Color composite, monochrome and audio output. For original CoCo D, E and F boards. \$24.95.

Mono II for Color Computer 2. An excellent monochrome monitor driver that has audio output also. 124.95.



Specify model needed.

64K UPGRADES



Pretested. Guaranteed. Instantly access 64K via M/L totally solderless kit to upgrade E Boards. Kit includes eight 4164 prime chips and chips U29 and U11 already soldered. E Board Kit \$69.95 F Board and Color Computer 2. \$57.00

THE VERY BEST IN GRAPHICS

BIORK BLOCKS

An incredible graphic utility. Fun. Easy. Create graphic screens as good as any you have seen. All you need is a joystick or mouse. "The most user friendly program I have ever seen for the CoCo. For those of you with graphic interests, I guarantee that you will not be disappointed." Review in Rainbow, Oct. 1984.

Requires 32K EXB (64K for animation) Tape or Disk \$34.95 **BUILDING BLOCKS 1** (Picture Disk) \$15.95

SPECIAL: BIORK BLOCKS and GRAPHICOM \$55.00



Created with Bjork Blocks

GRAPHICOM

Buy Graphicom from us and get one of our unique picture disks free! Get our improved Picture Disk One also. The first in the new generation of graphic utilities. An excellent utility. Requires: 64K EXB, Disk Drive and Joy Sticks. Three disks and the best bound documentation for only \$29.95.

Caligraphy STAMP DISK: Useful letters and designs for making your own signs and menu screens.

Adventure Disk I: Indoor scenes and objects. Helps you draw pictures and learn more about Graphicom.

Adventure Disk II: Outdoor scenes and objects. A Graphicom tutorial as well as a useful library of images you can use.

ABGDEFGHI STHVWXY7 123456789 abodefahijhl

Caligraphy Disk



Adventure Disk II

🖒 Adventure Disk 1



2 Picture Disks \$24.95 3 Picture Disks \$29.95

MORETON BAY SOFTWARE

A Division of Moreton Bay Laboratory



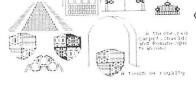
316 CASTILLO STREET SANTA BARBARA. CALIFORNIA 93101 (805) 962-3127



Ordering information



Add \$2.00 shipping and handling per order. We ship within 24 hours on receipt of order. Blue Label Service available. California residents add 6% sales tax.



CoCo Cooler II To Help CoCo Breathe Easier

This is one addition your computer will surely welcome, especially if it gets a little hot under the collar at times. The CoCo Cooler II is a device for removing the hot air that can accumulate under the cover of your CoCo 2 due to the heat producing circuitry inside. The Cooler is actually a fan that blows air away from the computer, as opposed to into it. This prevents dust from being blown into the sensitive insides of your machine. The fan is approximately a 1¾-inch tall unit with a 1½-inch square base. It can be fastened to your computer with the double-sided tape on the bottom of the base or by use of the four holes in the corners for a more secure attachment than the tape. The instructions suggest that you place the fan over the power supply, which is a big source of heat buildup.

When I received the Cooler, I noticed that the label attached to it marked the direction the air should flow, but after plugging it into an AC outlet, it was obvious the fan was blowing in reverse. I made a quick call to the local distributor for Spectrum Projects and he in turn called Bob Rosen. It seems that the manufacturer of the units wired some of them incorrectly. This will not hurt the Cooler and is as simple to solve as reversing the two wires that lead to the fan. This is an easy task since a foot or so of the connection is left as two separately insulated wires instead of the two-wires-in-one-insulation type of cord most often used. In general I would have to say that if you have a heat problem with your computer, the CoCo Cooler II is an excellent product that will greatly help, if not totally solve, a heat buildup. By the way, the Cooler II will also help remove heat from overheating disk

(Spectrum Projects, Inc., Box 21272, Woodhaven, NY 11421, or P.O. Box 9866, San Jose, CA 95157-0866, \$49.95 plus \$3 S/H)

- Jim Sewell

One-Liner Contest Winner . . .

This program draws boxes of various sizes in one corner, then another and another and another. It then moves the four square cones over the screen using the PCOPY command.

The listing:

Ø PCLEAR8:PMODE4,1:SCREEN1:PCLS1
:FORA=ØTO3:DRAW"BM128,96CØA=A;":
FORZ=3TO68STEP2:N=Z/6+1:PLAY"L25
5V31N=N;":DRAW"R=Z;D=Z;L=Z;U=Z;B
H3":NEXTZ,A:FORC=ØTO2Ø:FORS=ØTO1
:SCREEN1:PMODE4,5-4*S:SOUNDRND(2
55),1:FORY=1TO4:PCOPY Y+S*4TOY-4
*(Y<4)+1-4*S:NEXTY,S,C:RUN</pre>

Jacques Pannetier Saint-Laurent, Quebec

(For this winning one-liner contest entry, the author has been sent copies of both *The Rainbow Book Of Simulations* and its companion *Rainbow Simulations Tape.*)

Create Graphics Masterpieces With Rembrandt

By Bruce Rothermel

I really like my Color Computer. However, I sometimes look at the capabilities of the newer mega-buck computers with more than a little jealousy. For example, the Macintosh computer has graphics capabilities that make me a little green with envy. Admittedly, the Mac's graphics are monochrome, but they sure are nice.

Well, I'm pleased to report that a program has been released which gives advanced graphics capabilities to the CoCo. Appropriately called *Rembrandt*, this program allows the Color Computer to:

— Draw lines, circles and ellipses

- Fill in areas (paint) in 16 patterns.

- Repeat a pattern from one part of the screen to others (Stamp).
- Enlarge a portion of the screen and edit that area.
- Put text on the graphics screen.

Save and load pictures.

Rembrandt's graphics utilize the highest resolution PMODE 4 screens with "artifacts" to produce more than the two colors Radio Shack says you can have in this mode. A small BASIC program is included to ensure that the Hi-Res graphics colors are correct.

There are three operation modes in *Rembrandt*. These are the full-screen line-drawing mode, the menu/select mode, and the close-up enlarge/edit mode.

The full-screen line-drawing mode is used to create the general foundation or framework of the picture. The menu modes allow you to select a particular function or parameter by presenting a list of options. The main menu mode has several options, all other submenus are selected from the main menu.

The enlarge/edit mode allows you to "blowup" a portion of the screen for detailed close-up editing. It is used to put the finishing touches on a picture you have created, or to patch errors that would be too tedious to correct in the full-screen mode.

Almost all functions can be controlled by the right joystick. The only time the keyboard needs to be used is to enter text or enter the name of a picture to be saved. In operation, after the program is loaded, you are greeted with the main menu. At this point you have 12 options:

White, Black, Red, Blue, Paint, Circle, Screen Modes, Stamp Function, Enlarge/Edit, I/O Functions, Initialize, or Return.

The first four choices change the current color. The current color is shown with a dot next to it.

Drawing lines is done while in the full-screen mode. The right joystick controls the position of the cursor which is surrounded by a box in the screen. Lines are drawn by tapping the joystick button where you want the line to start and then moving and tapping the cursor where you want the line to terminate.

Circles are drawn by tapping the joystick at the center point of the circle. As you hold the button, a circle with an increasing diameter appears. Tapping the button a second time freezes the circle. Moving the joystick left or right, up or down, while the circle is being drawn turns it into an ellipse.

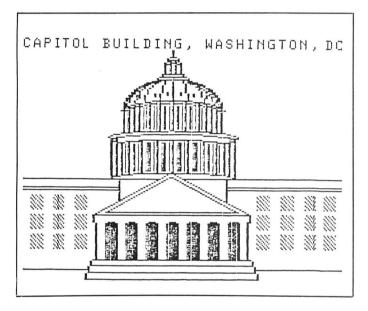
Paint allows you to fill-in any specified area with up

to 16 colors and patterns. A nice feature with *Rembrandt* is that you have the option to erase your last command by pressing the CLEAR button.

The last graphics option available from the main menu is the Stamp function. This option allows you to select any 32 x 32 portion of the screen and use it as a stamp to duplicate whatever is in that box anywhere else on the screen. Options allow you to place this stamp on top of or under anything on the screen.

Initialize wipes whatever picture is in memory by painting the current screen in the current color. With many of the options, submenus give you additional options to customize your creation.

Text can be added to your drawing by pressing 'X' on the keyboard. A red graphics cursor then appears. By pressing the arrow keys, graphics can be placed anywhere on the screen. True lowercase with real descenders is



possible by pressing SHIFT and 0; this acts as a toggle between caps and lowercase and all capitals.

The mode which makes *Rembrandt* very usable for fine, detailed drawing is the enlarge/edit mode. In this mode, you can select any portion of the screen so it can be enlarged 12 times for detailed examination and editing. Each of the 49,152 pixels (dots) which compose the screen can be individually colored to add detail or correct errors. You always have a reference as to what this enlargement will look like in the actual size version, because beneath the blowup the area being worked on appears in normal size.

The detail that can be obtained in this mode is quite impressive, although filling in the screen one pixel at a time is quite time-consuming, but with the tools offered, very impressive graphics can be created.

The only shortcomings I found were a complete lack of any reference in the tape version regarding how your completed masterpiece can be printed. What good is spending hours creating the ultimate Color Computer graphics if it can only be displayed on a screen? It's quite difficult carrying your CoCo and TV around to show your creation.

The other objection I had is the reaction of the cursor when it is being controlled by the joystick. The block surrounding the cursor moves in the direction of the cursor, but not at the same speed. As you move the cursor, for example, to the upper-left corner of the box, the box drifts

in that direction, but at a different speed. This results in a lot of wiggling and overshooting your target on the screen. It takes a little getting used to. It would be nice to have the option of moving the cursor with the arrow keys as well as the joystick.

If you have a 64K Extended BASIC disk system, an advanced version of *Rembrandt* is available. The main advantage of the disk system is the ability to rapidly save and access pictures. Completed graphics are stored on the disk and a small file management program is included to simplify storing and recalling your masterpieces.

The good news is that the disk version, being a later release, includes brief instructions on how to use a screen print program and a dot matrix printer to make a hard copy of your creation. The bad news is that the instructions don't work. Completed pictures have be to loaded into the computer using the BASIC command LOADM''filename/REM'', rather than the LOAD''filename/REM'' instructions given in the manual.

The screen print shown is a greatly reduced reproduction created by one of the demo drawings supplied with the program. While it does not show the brilliant colors obtainable with *Rembrandt*, it gives you an idea of the fine detail available when using the program.

If you are "into" computer graphics, Rembrandt seems to maximize the capabilities of the Color Computer. With it, you are able to create graphics and pictures that are otherwise impossible according to Radio Shack documentation. Suddenly that Macintosh doesn't look as good anymore!

(Family Computers, 4047 Bee Ridge Road, Sarasota, FL 33582, cassette \$24.95, requires 32K minimum ECB; disk \$27.95, requires 64K ECB)

One-Liner Contest Winner . . .

This program, called *Cylinder*, draws some very nice random pictures of cylinders made up of diagonal lines. If the screen doesn't clear the first time, press BREAK and run the program again.

The listing:

1 IFR=0THENPCLS:R=64:GOTO1ELSEPM ODE3+INT(RND(0)+.5):SCREEN1,INT(RND(0)+.5):COLORINT(RND(8)+.5),1 :FORZ=360T01STEP-4:C=Z+3.14:C=C* 3.14/180:X=INT(68+R*COS(C)):Y=IN T(66+R*SIN(C)):LINE(X,Y)-(X+120, Y+60),PSET:NEXT:IFR<33THENR=64:G OTO1ELSER=R-16:GOTO1

> Rolla Price Sulphur Springs, MO

(For this winning one-liner contest entry, the author has been sent copies of both *The Rainbow Book Of Simulations* and its companion *Rainbow Simulations Tape.*)

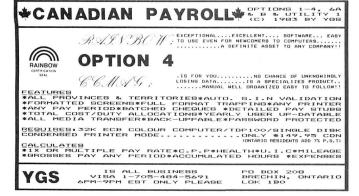
Keep A Computer Calendar With *Don't Forget*

Don't Forget is a disk-based program from Computerware that allows you to construct and maintain an appointment calendar. To start using it, you perform the following steps:

- 1) Turn on your Color Computer, monitor and printer.
- 2) Put the program disk in Drive 0.
- 3) Put a blank formatted disk in Drive 1.
- 4) RUN ''REMEMBER''
- 5) The program will ask you (on an excellent Hi-Res screen) to say which drive has which disk. It will then ask you whether you are going to use keyboard arrows or joystick.
- 6) You will then be given a menu. Choose "Build a new calendar year."
- 7) Choose the month and year where you want to begin; the program will draw a picture of that month on the screen one of its talents.
- 8) Move the cursor to a date and enter. You will be given a "page" with icons (little pictures the latest rage) at the top, room to enter two lines in a section called "Special Occasions," lines with hour headings to enter appointments, and a section labeled "Memo."
- 9) Say, on a particular day, you have a dentist appointment at 3:00. Move the cursor to the keyboard icon, ENTER (to show that you are going to type in something), move the cursor to the "3:00" line, type in "dentist" and enter. Is this day Joe's birthday? Move the cursor to Special Occasion and type "Joe's birthday." Now move the cursor to the Memo section and type "pick up cake at bakery for party" and enter.
- 10) Is that all for this day right now? Move the cursor to the disk icon and enter. Drive I will come on and save the data. Move to another day, or another month, and continue for as long as time and patience permit. For example, go through the year and put in all birthdays, anniversaries and holidays. Put in the dates of conferences, vacations, etc. Just remember to save each day's entries to the disk before you leave that "page" or your entries will be lost.

To use the appointment calendar, repeat the steps above, except in step 3 you will put your calendar disk in Drive 1. You can now call any month and date, add other entries and look at what is already entered.

Suppose you want to know what is on the schedule for today. This is the sequence: Turn on your computer, load the program disk and calendar disk, run the program, tell



it the program is in Drive 0, that you are using joysticks, that you want February 1985 and that you want to see the 11th. Do you want to have a hard copy? Move the cursor to the printer icon and enter. It will print out just what is on the screen. You can also print out a week's calendar — 7 days from the day you are in.

Another option is to print out a blank calendar for the selected month to use as a scratchpad for appointments to be entered on your calendar disk at a convenient time.

Suppose you changed your dentist appointment to 4:00. You can move the cursor to the 3:00 line and enter, now move the cursor to the scissors icon and enter, and then move the cursor from the 4:00 line and enter. Or, you could move the cursor from the scissors to the trash can icon and enter. It is now deleted. Did you change your appointment to Thursday? Move the cursor from the scissors to the clipboard and enter. It is now saved. Move the cursor to disk and save the revised day. Go back to the February calendar page and select Thursday. Move the cursor to the clipboard, enter, move it to the time of your appointment and enter. Go to the disk icon to save this day.

Does that seem like a complicated way to maintain an appointment calendar for the year? Well, what is the alternative? You will have to go to any stationery store and buy a book which has preprinted calendar pages.

Why would anyone want to use a computerized calendar? Well, if the first thing you do each day is to turn on your CoCo, it is not too hard to run this program first. And don't forget that if your CoCo is a business and office machine, more than one person can use *Don't Forget*—each with his or her own calendar disk. There is also the convenience of setting up the second and succeeding years. *Don't Forget* will copy all the special occasion items onto your new disk for you.

Which system will serve you best? There is an old computer maxim that if a 3 x 5 card will do the job, use it; it is quicker and easier. Is this the case here? As one who must live by an appointment book, I am addicted to one that shows a week on facing pages with a column for each day with hours and half-hours shown, plus room for memos. Each January when I get a new one, I have to go through and put in all the birthdays, anniversaries, etc. The phone rings all day long, and I am constantly checking, entering and altering entries.

Is there anything the program cannot do as well as the book? One thing I do frequently is check back and see when I met with Mr. Jones. With *Don't Forget*, after loading, etc., I can search the calendar by key word and it will give me the calendar pages on which Mr. Jones' name appears. My only other problem was that I could not figure how to show an appointment for 10:30 or 3:15 — all *Don't Forget's* lines show even hours and I could not overwrite them.

Computerware is a large and dependable software vendor and this program's quality is up to their standard. It performs flawlessly and its Hi-Res screen is state-of-the-art. As with most of their offerings, documentation is rather thin, with just enough instructions to get you going. Some little problems we had to work out with some trial and error.

(Computerware, P.O. Box 668, 4403 Manchester Ave., Encinitas, CA 92024, disk \$24.95 plus \$2 S/H)

- Randy Graham

Corrections

"Christmas Card File And Labeler" (December 1984, Page 42): James Ball tells us there is a problem with Line 1740. The last statement reads:

IFA<LB THEN2080

This should be changed to:

IF A<LB THEN 1790

In addition, the program as presented in the December issue sets aside a five-character space for a ZIP code as used in the United States. Users in some other countries (or who are sending cards to other countries) may need space for a longer postal code. For example, Canada Post uses a code made up of six letters and numerals with a space, so a seven-character space is required. The suggested fix borrows the needed characters from the state/province field, which is adjacent to the postal code field. (This field will now accept only three characters, so the two-character state and province codes set by the Postal Service and by Canada Post will have to be used.)

Make these changes within the following lines:

940 MID\$(A\$(R),60,3)=ST\$. . MID\$(A\$(R),64,7) =ZIP\$

2560 IF LEN(ST\$)>4 THEN . . . PRINT''LIMIT TO 3

2570 (Add two more spaces between the second pair of quotes for a total of seven.)

2580 IF LEN(ZIP\$<>6 THEN... PRINT 'ENTRY ERROR'

2870 IF LEN(ST\$) < 3 THEN . . .

2940 ST\$=MID\$(A\$(R),60,3)

2960 ZIP\$=MID\$(A\$(R),63,7)

These changes should be sufficient for a seven-character postal code. Further expansion is possible using an analogous procedure. If you've entered data under the original version and then make these changes, your original information will be incorrectly displayed. The easiest way to rectify this is to edit each record accordingly.

"A Simple Text Processor" (January 1985, Page 103): Ashok Basargekar tells us that several of the ROM calls are not compatible with Radio Shack's Disk BASIC

1.1 ROM. (This ROM is found in the disk controller, and the problem has no connection whatsoever with the ROMs in the computer itself.) These changed ROM addresses (which appeared on Page 160 of the March 1984 issue) should serve as a guide to modifying the program:

1.0 ROM	1.1 ROM	Function
C468	C48D	Open file
C6C5	C6F5	Kill file
C8A4	C952	Process filename
CA3B	CAE9	Close all files
CA53	CB01	Close file
CBD2	CCB2	Directory
CEA2	CF7E	SAVEM
CF07	CFE3	LOADM

Note that these changes apply only if you have the new Disk BASIC ROM; the modified program will not work with the old ROM.

Also, if your computer has Color BASIC 1.2 or 1.3 (EXEC 41175 to find out), the calls to the keyboard routine at \$A1C1 should be changed to \$A1CB. This change should not affect operation on computers having the old 1.1 Color BASIC ROM.

For those who get the RAINBOW ON TAPE, make the following PDKEs after CLDADing the text processor:

POKE &HEB3,&H27

POKE &HFB6,&H5C

POKE &HFB7,&HB1: POKE &HFB8,&HOD POKE &HFB9,&H27: POKE &HFBA,&H23

CSAVEM or SAVEM "TEXTPRO", &HEOO, &H16CD, &HEOO

For those who have assembled the source listing, make the following corrections to the source listing and reassemble the program:

Line 00920: CMPY <\$27 Top of RAM reached?

Add Line 02745: INCB

Delete Line 02770: (INCB instruction is moved up two instructions.)

"The Art of Joystick Painting" (October 1984, Page 97): Brian Preble tells us that a couple of problems have arisen with the program *Sketch*. First, the SN Error you often get when running the program is caused by the notorious PCLEAR bug in the old Extended BASIC ROM. Just enter RUN again to start the program. (If you have the new Extended BASIC 1.1 ROM, you should not have this problem.) Secondly, the garbage that appears when the program is first run is normal. Since *Sketch* was designed to work with pictures created by other programs, it doesn't clear the graphics screens when you start it. If this bothers you, just type PCLS before running it.

CoCo Cat







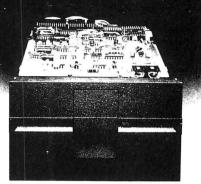


NEW DISK DRIVES

STARTING AT

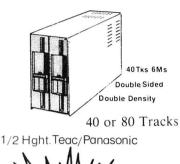
29.00

WITH CASE & **POWER SUPPLY** \$169.95



TANDON MPI TEAC

Speed 6 ms tk to tk and up Capacity 250k unformatted Tracks 40 Warranty now 1 YEAR





New Low Price!

We carry only the finest quality disk drives *no seconds * no surplus

We carry only the filest quality disk drives the seconds the surplus
SATISFACTION GUARANTEED!! ALL DRIVES FULLY TESTED & WARRANTEED
Complete Disk Drive with Power Supply&Case \$169.95
Two Drives in Dual Case & Power Supply 1995\$279.95
1/2 ht double sided double density Disk Drives (Panasonic/Teac) \$159.00
1/2 ht double sided double density Disk Drive with ps&case \$199.95
How to use your new drive system on audio cassette
Single ps&case \$44.95 Dual 1/2 ht ps&case\$54.95 Dual ps&case Call
Color Computer Controller (J&M) DRIVE Ø FOR RADIO SHACK COLOR COMPUTER \$129.95
TANDON, MPI OR TEAC DRIVE (SINGLE SIDED 40 TRACKS SPEED 5 MS TRK TO TRK & UP) POWER SUPPLY and CASE, TWO DRIVE CABLE WITH ALL GOLD CONNECTORS \$329.95 \$SALE! PANASONIC 1/2 HEIGHT DOUBLE SIDED DOUBLE DENSITY DRIVE 500K unformatted FOR US POWER SUPPLY and CASE 2 DRIVE CABLE WITH ALL GOLD CONNECTORS
PANASONIC 1/2 HEIGHT DOUBLE SIDED DOUBLE DENSITY DRIVE 500K unformatted POWER SUPPLY and CASE, 2 DRIVE CABLE WITH ALL GOLD CONNECTORS J&M CONTROLLER, MANUAL and DOCUMENTATION
DISKETTES with free library case \$17.95 Unadvertised Specials \$Call

TECHNICAL STAFF ON DUTY, PLEASE CALL FOR ASSISTANCE.



CALL US TODAY!! (617)234-7047 * DEALER INQUIRIES INVITED. ORDER TOLL FREE 1-800-635-0300

(617) 234-7047



TRUE DATA PRODUCTS

195 Linwood Street, P.O. Box 546 Linwood, Massachusetts 01525 (617) 234-7047

Drives cleaned, aligned & tested

HOURS MON-SAT 9-6 (EST)

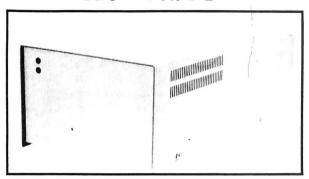
We welcome

- Visa/Master Charge
- Checks (allow 2 weeks for clearing)
- · C.O.D. Add \$2.00

New Hard Drives

----- COMPLETE SYSTEM ----- JUST PLUG IN ------

Call For BEST PRICE



Warranty - One Full Year

5 to 20 Megabyte, ready to run on the TRS 80 Model I/III/IV/4P, color computer,

64K UPGRADES *3995

QUALITY VIDEO MONITORS

Starting at

\$79. ⁹⁵

MONOCHROME **COLOR MONITORS**



VIDEO DRIVER

ENABLES YOUR COCO TO OPERATE WITH A VIDEO MONITOR INSTEAD OF A TELEVISION!

SCREEN DUMP PROGRAM

The best screen dump program for the Epson & Gemini printers ever!! Have the option of standard images or reverse w/regular or double sized pictures

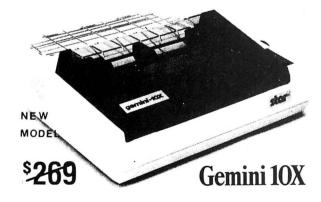
PRINTER CABLES AND INTERFACES AVAILABLE Call for current pricing

NTERS

- Bidirectional Logic Seeking
- Friction and Tractor
- 9X9 Dot Matrix True Decenders
- · High Res-Bit Image Block Graphics
- Super Script-Subscript
- Underlining
- Backspacing Doublestrike 5, 6, 8 1/2, 10, 12 and 17 Pitch
- Programmable Line SpacingSIX (6) MONTH WARRANTY

GEMINI 10X (9 Inch Carriage, 120cps) Friction and Tractor....\$CALL GEMINI 15X (15 Inch Carriage, 120cps) Friction and Tractor \$CALL DELTA 10 (10 Inch Carriage, 160cps) Friction and Tractor.....

POWER TYPE Letter quality



SP-3 INTERFACE for Color Computer

- 300-19,200 BAUD rates
- External to printer No AC Plugs
- Built in modem/printer switch—no need for Y-cables or plugging/unplugging cables

Only:



COMPLETE SYSTEM

now with screen dump

Nothing more to buy!

Dealer inquiries invited



<u>TRUE DATA PRODUCTS</u>

195 Linwood Street, P.O. Box 546 Linwood, Massachusetts 01525



CALL US TODAY!! ORDER TOLL FREE

(617)234-7047 1-800-635-0300



The author contends that people — especially children — are likely to stay with a program longer if joysticks are used for input. Test his theory on this joystick menu and see if you agree.

Joystick-to-itiveness

By T.C. Taulli

his tutorial shows you the advantages of incorporating joysticks in all your programs. I have also provided a program to give you a taste of the joystick menu.

Here are seven advantages:

- People find inputting with joysticks easier because all the options are in front of the person. There's no way a person will get a syntax error.
- 2) Inputting a number is less error prone. People don't have to keep reaching up on the keyboard when typing.
- 3) It's easier for kids and adults. Most kids don't like learning the different commands keyboard input programs have. And adults don't have two hours to spend studying what the game will do if you press a certain key.
- 4) Joysticks will make your program more entertaining, enjoyable and user-friendly. This will help people improve what they're doing instead of being bogged down by the tiring process of keyboard input.

(T.C. Taulli is the author of the game Do or Die, and is a member of Color America Users Group.)

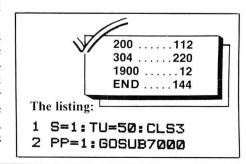
- 5) It's easier for people who can't type. And, since the average kid can't type, more kids will buy joystick controlled games. When you add up all the adults and kids that want your joystick controlled program, you will have a big market for your program.
- 6) If you have played a multiple-player game, you know how hard it is to keep maneuvering when it's your turn at the keyboard. With joysticks, people can play multiple-player programs faster. Even sharing a joystick would be more practical than using the keyboard.
- 7) Joysticks are just plain fun.

If you're convinced joysticks will make your game a "cut above the rest," then type in the program below or buy RAINBOW ON TAPE (if you haven't already).

The program listing below is a joystick controlled menu that can be used to choose parameters for Adventure games. If you use a joystick menu in your Adventure, it would come after all the data has been read and after the title screen. You can do what you want, and feel free to use any of my ideas in this short program.

If you don't know how to use the skill level routine, then read on. In order to pick a skill level, put the cursor by the skill level you want and press the joystick button. The skill level will be switched into inverse video. This is so you know which skill level you selected and you won't keep choosing a skill level you've already selected.

The joystick menu is good for any program. It will make Simulations easier and cleaner. It will also make Adventures better. But, you might ask yourself, "Why do I need joysticks in my Adventure? Adventures are played by inputting commands from the keyboard." Well, it will still give you an edge over standard Adventure games and the *Third Annual Rainbow Adventure Contest* is being launched this month!



305 IFY=19THEN1000 3 CLS3:PRINT@12,"OPTIONS:";:GOTO 306 IFY=20THEN9099 80 40 'THIS IS WHERE THE SECOND MEN 307 IFY=21THEN9099 U IS PRINTED 400 PP=1:GOTO80 500 PP=2:GOTO80 50 FORX=1T0250:NEXT:PRINT@225,"L OAD IN SAVED GAME"; 600 PP=3:GOTO80 52 PRINT@289,"CHANGE MENU ONE"; 700 GOTO245 53 PRINT@321, "START THE ADVENTUR 900 FORX=1T0250:NEXT:GOT01900 E"; 950 'THIS IS THE TURN ROUTINE 56 PRINT@492, "TURNS: "; TU; 951 PRINT@384, "POSITION STICK FU 61 PRINT@257, "PICK TURNS"; : GOTO2 LLY UP TO INCREASE TURNS OR FULLY DOWN TO DECREASE YOUR TUR 70 'THIS IS WHERE THE FIRST MENU NS"; IS PRINTED 953 PRINT@491, CHR\$(143+80); 80 FORX=1T0250:NEXT:PRINT@65,"SK 954 PRINT@498, TU; 955 JJ=JOYSTK(0):JY=JOYSTK(1) ILL LEVEL ONE"; 81 PRINT@97, "SKILL LEVEL TWO"; 960 IF JY=0 THEN TU=TU+1 961 IF JY=63 THEN TU=TU-1 82 PRINT@129, "SKILL LEVEL THREE" 962 IF TU>110 THEN TU=110 83 PRINT@161,"GO TO MENU TWO": 963 IF TU<40 THEN TU=40 84 IFPP=1THENPRINT@65, "skill lev 964 FORX=1 TO 50: NEXT el one"; 965 B=PEEK (65280) 85 IFPP=2THENPRINT@97, "skill lev 966 IFB=2540RB=126THEN968 el two": 967 GOTO954 86 IFPP=3THENPRINT@129,"skill le 968 PRINT@491, CHR\$(143+32);:GOTO vel three"; 200 FOR X=1T0250:NEXT 1000 GOTO80 201 E=JOYSTK(0):0=JOYSTK(1):IFO< 1100 GOTO10000 4THENO=4'THIS IS WHERE YOU PICK 1900 CLS FROM MENU ONE 2000 PRINT"THIS IS WHERE YOU WOU 202 IFO>11THENO=11 LD HAVE A SUBROUTINE THAT LOA DS IN A SAVED GAME" 203 SET(1,0,5) 232 B=PEEK (65280) 2001 PRINT: PRINT" PRESS JOYSTICK 234 IFB=2540RB=126THEN238 TO GO BACK TO THEBEGINNING" 236 SET(0,0,3) 2002 B=PEEK (65280) 2003 IFB=2540RB=126THEN1 237 GOTO201 2005 GOTO2002 238 SET(0,0,3): IFO=4THEN400 239 IFO=5THEN400 7000 FORX=1T0250:NEXT:PRINT@0."* 240 IFO=6THEN500 THE JOYSTICK * *" 241 IFO=7THEN500 7001 PLAY"05L34DEDEDEDEDEDEDEDED 242 IFO=8THEN600 243 IFO=9THEN600 EDEDEDE": PRINT@75, "TUTORIAL"; 244 IFO=10THEN700: IFO=11THEN700 7002 PRINT@134, "****BY TC TAULLI ****" 245 GOTO50 246 FOR X=1TO250: NEXT'THIS IS WH 7003 PRINT@192, "PRESS THE RIGHT ERE YOU PICK FROM MENU TWO JOYSTICK BUTTON TO SEE THE JOYST 247 Z=JOYSTK(0):Y=JOYSTK(1) ICK MENU PROGRAM"; 248 IFY<14THENY=14 7004 PRINT@458, "**(C) 1984**"; 249 IFY>21THENY=21 7030 B=PEEK (65280) 250 SET (0,Y,5) 7040 IFB=2540RB=126THENRETURN 251 B=PEEK (65280) 7070 GOTO7030 252 IFB=2540RB=126THEN300 9099 FORX=1T0250:NEXT 254 SET(0,Y,3) 10000 CLS:PRINT"THIS IS WHERE TH 256 GOTO247 E ADVENTURE WOULD START" 300 SET(0,Y,3):IFY=14THEN900 10001 PRINT: PRINT"PRESS JOYSTICK 301 IFY=15THEN900 TO GO BACK TO THEBEGINNING" 302 IFY=16THEN950 10010 B=PEEK(65280) 10020 IFB=2540RB=126THEN1 303 IFY=17THEN950 10030 GOTO10010 304 IFY=18THEN1000



VISA

1-416-529-1319



GRAPHICMASTER

This extremely powerful, compact program adds 30 new commands to any version of RS COCO BASIC. The commands are more versatile and operate up to 60 times faster than Extended Basic.

You write your own Basic graphic programs that operate so fast they appear to be written in machine language. For even greater speed you can compile the final program (compiler not supplied). Works with TEXTMASTER and PRINTMASTER.

32 software sprights, dual page flipping, vertical scroll, polygon and dye are just a few of the features you can use in your own programs. A 60 page manual is included.

\$42.95US \$49.95CR

\$46.95US +\$2.50 \$53.95CN S&H

Double sided

\$9.95US \$12.95CR

prototyping board

TEXTMASTER

Textmaster displays text on the graphics screen using one of the supplied character sets or a custom set that you create (Hebrew, Greek, Chinese etc.) to use the completely redefinable keyboard. Residing in the top of a 64K machine it takes only 8 bytes from Basic. Many additional features have been added like smooth scroll, top and bottom scroll protect, key beep and repeat, full error messages, non destructive cursor,

A total of 24 sizes of text are possible in line lengths of 32,36,42,51,64, & 85 chrs./line. Text can be echoed to a printer using the printers character set or you can use PRINTMASTER to print exactly what you see on the screen.

This unprotected program comes in a vinyl binder with full documentation, a demo program and character design program.

29.95CR

\$29 .95US +\$2 .50 \$33 95CR

125 SOUTH FIFTH STREET LEWISTON, N.Y. 14092

invert text etc..

420 FERGUSON AVE. HAMILTON, ONT., L8L 4Y9

BAILSOW Info

How To Read Rainbow

Please note that all the BASIC program listings you will find in THE RAINBOW are formatted for a 32-character screen —so they will show up just as they do on your CoCo screen. One easy way to check on the accuracy of your typing is to compare what character "goes under" what. If the characters match — and your line endings come out the same — you have a pretty good way of knowing that your typing is accurate.

We also have "key boxes" to show you the *minimum* system a program needs. But, do read the text before you start

typing.

Finally, the little cassette symbol on listings indicates that program is available through our RAINBOW ON TAPE service. An order form for this service is on the insert card bound in the magazine.

What's A CoCo

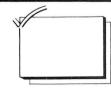
CoCo is an affectionate name which was first given to the TRS-80 Color Computer by its many fans, users and owners. As such, it is almost a generic term for three computers, all of which are very much alike.

When we use the term CoCo, we refer to the TRS-80 Color Computer, the TDP System-100 Computer and the Dragon-32 Computer. It is easier than using the three "given" names throughout THE

RAINBOW.

In most cases, when a specific computer is mentioned, the application is for that specific computer. However, since the TDP System-100 and TRS-80 Color are, for all purposes, the same computer in a different case, these terms are almost always interchangeable.

The Rainbow Check Plus



The small boxes that you see accompanying programs in the THE RAINBOW are the "Check system," which is designed to help you type in programs accurately.

Rainbow Check PLUS will count the number and values of characters you type in. You can then compare the number you get to those printed in THE RAINBOW. On longer programs, some benchmark lines are given. When you

reach the end of one of those lines with your typing, simply check to see if the numbers match.

To use the Rainbow Check PLUS, type in the program and CSAVE it for later use, then type in the command RUN and press ENTER. Once the program has run, type NEW ENTER to remove it from the area where the program you're typing in will

Now, whenever you press the down arrow key, your CoCo will give you the checksum based on the length and content of the program in memory. This is to check against the numbers printed in THE RAINBOW. If your number is different, check the listing carefully to be sure that you typed in the correct BASIC program code. For more details on this helpful utility, refer to H. Allen Curtis' article on Page 21 of the February 1984 RAINBOW.

Since Rainbow Check PLUS counts spaces and punctuation, be sure to type in the listing exactly the way it's given in the magazine.

10 CLS:X=256*PEEK(35)+178

20 CLEAR 25, X-1

30 X=256*PEEK (35)+178

40 FOR Z=X TO X+77

50 READ Y:W=W+Y:PRINT Z,Y;W

60 POKE Z,Y:NEXT

70 IFW=7985THEN80ELSEPRINT
''DATA ERROR'':STOP

80 EXEC X:END

90 DATA 182, 1, 106, 167, 140, 60, 134 100 DATA 126, 183, 1, 106, 190, 1, 107

110 DATA 175, 140, 50, 48, 140, 4, 191 120 DATA 1, 107, 57, 129, 10, 38, 38

130 DATA 52, 22, 79, 158, 25, 230, 129

140 DATA 39, 12, 171, 128, 171, 128 150 DATA 230, 132, 38, 250, 48, 1, 32

160 DATA 240, 183, 2, 222, 48, 140, 14

170 DATA 159, 166, 166, 132, 28, 254 180 DATA 189, 173, 198, 53, 22, 126, 0

180 DHTH 189, 173, 198, 53, 22, 126 190 DATA 0, 135, 255, 134, 40, 55

200 DATA 51, 52, 41, 0

Using Machine Language

Machine Language programs are one of the features of THERAINBOW. There are a number of ways to "get" these programs into memory so that you can operate them.

The easiest way is by using an Editor-Assembler, a program you can purchase from a number of sources.

An editor-assembler allows you to enter mnemonics into your CoCo and then have the editor-assembler assemble them into specific instructions that are understood by the 6809 chip that controls your computer.

When you use an editor-assembler, all you have to do, essentially, is copy the relevant instructions from THE RAINBOW'S listing into CoCo.

Another method of getting an assembly language listing into CoCo is called "hand assembly." As the name implies, you do the assembly by hand. This can sometimes cause problems when you have to set up an ORIGIN statement or an EQUATE. In short, you have to know something about assembly to hand assemble some programs.

Use the following program if you wish to hand assemble machine language

listings:

10 CLEAR200,&H3F00:1=&H3F80

20 PRINT ''ADDRESS:'';HEX\$(I);

30 INPUT ''BYTE'';B\$

40 POKE I, VAL(''H' '+B\$)

50 I=I+1:GOTO 20

This program assumes you have a 16K CoCo. If you have 32K, change the &H3F00 in Line 10 to &H7F00.

The Rainbow Seal



The Rainbow Certification Seal is our way of helping you, the consumer. The purpose of the Seal is to certify to you that any product which carries the Seal has been physically seen by us and that it does, indeed, exist.

Manufacturers of products — hardware, software and firmware — are encouraged by us to submit their products to THE RAINBOW for certification. We ascertain that their products are, in actuality, what they purport to be and, upon such determination, award a Seal. This lets you know that we have seen the product and that it does, indeed, exist.

The Seal, however, is not a "guarantee of satisfaction." The certification process is different from the review process. You are encouraged to read our reviews to determine whether the product is

right for your needs.

There is absolutely no relationship between advertising in THE RAINBOW and the certification process. Certification is open and available to any product pertaining to CoCo. A Seal will be awarded to any commercial product, regardless of whether the firm advertises or not.

We will appreciate knowing of instances of violation of Seal use.

THE COLORSOFT™ BUSINESS SYSTEM

INTEGRATED BUSINESS SOFTWARE DESIGNED FOR THE COLOR COMPUTER WRITTEN FOR USE BY THE NON-ACCOUNTING ORIENTED BUSINESSMAN CONCISE USERS MANUAL WITH SAMPLE TRANSACTIONS TUTORIAL PROFESSIONALLY WRITTEN AND FULLY TESTED HIGHLY USER FRIENDLY AND MENU DRIVEN AFTER THE SALE SUPPORT

SMALL BUSINESS ACCOUNTING (Version 2.0) This sales-based accounting package is designed for the non-accounting oriented businessman. It also contains the flexibility for the accounting oriented user to set up a double entry journal with an almost unlimited chart of accounts. This package includes Sales Entry, transaction driven Accounts Receivable and Accounts Payable, Journal Entry, Payroll Disbursement, and Record Maintenance programs. Screen and hardcopy system outputs include Balance Sheet, Income Statement, Customer and Vendor Status Reports, Accounts Receivable and Payable Aging Reports, Check Register, Sales Reports, Account Status Lists, and a Journal Posting List. The number of accounts is limited only by the number of disk drives. \$89.95

PAYROLL (Version 2.0) This integratable package is designed for maintaining personnel and payroll data for up to 200 hourly and salaried employees with 8 deductions each. This system calculates payroll and tax amounts, prints checks and maintains year-to-date totals. These amounts can be automatically transferred to the SBA package for financial reporting. It computes each pay period's totals for straight time, overtime, and bonus pay and determines taxes to be withheld. Additional outputs include mailing list, listing of employees, year-to-date federal and/or state tax listing, and a listing of current misc. deductions. This system is suited for use in all states except Oklahoma and Delaware. \$69.95

All programs require a minimum of 32K and 1 disk drive but will take advantage of 64K and multiple drives. Each package features a hi-res 51 x 24 black on green screen. 16K versions available without hi-res screen. Specify 16K or 32K versions when ordering. Future integrated packages will include: Inventory Control, Sales Analysis, Accounts Payable.

INCLUDE \$5.00 Shipping/Handling Per Order

Write for Free Catalog

BRANTEX, INC.

COLOR SOFTWARE SERVICES DIV.

BUSINESS SOFTWARE GROUP P.O. BOX 1708 GREENVILLE, TEXAS 75401



TELEPHONE ORDERS (214) 454-3674 COD/VISA/MASTERCARD

ATTENTION DEALERS: WE OFFER THE BEST DEALER PLANS AVAILABLE

6809 Arithmetic — The Way It All Adds Up

By R. Bartly Betts Rainbow Contributing Editor With Programs By Chris Bone

o far this column has dealt with reading and writing, but very little arithmetic. If your education is to be well rounded, it is time to take a look at assembly language calculations.

Chris and I have very different opinions in the area of arithmetic. He thinks life begins and ends with figures, calculations, algebra, trigonometry and the like. I think such things are closely related to the black plague and there should be an inoculation against them.

But duty calls and, whether for good or bad, arithmetic is essential in assembly language.

The Honor Roll

But wait, let's postpone the dreadful for a moment. Even more important than calculations is the need to recognize those who have answered the first challenge put forth by this column. If you still remember, the job was to create text on your display screen, then change all letter A's to asterisks. We had a number of good replies, and planned to announce the winner of the challenge sooner, but two factors caused postponements. First, the replies kept trickling in for quite awhile, and second, neither Chris nor I could decide who was a clear winner. Many of you did very well.

Both problems are now solved. First, no new programs have come in this month, (I am writing this in December) and second, we have created an honor roll of the best

(R. Bartly Betts is currently a technical writer for Tandy Corp. and is a former news reporter and magazine editor. As the father of 10 children, computers are his escape from reality.

Chris Bone is a college computer science major and has been programming for more than three years. He averages between six and nine hours a day on the CoCo.) programs (at least I think the list is complete). If you submitted a program that worked well, and do not see your name, either the post office or I must have lost it, and the guilty party might be me.

I am still trying to get my computer work space arranged since moving to Texas. So far I have had it in four different places, and I have enough "junk" to fill a room (four computers, two printers, monitors, drives, books and books and books, power bar, tools, an oscilloscope, and pieces and bits). As I think my equipment has finally found a permanent home, I now have to work on my filing system.

But now, the winners are, in no particular order:

William A. Smith — USS THORN (DD 988) FDP Miami, Fla.

H. B. "Zack" Zachry — Midwest City, Okla.

Kevin Deneen — (Sorry, Kevin, I lost your address)

Al Clarke — Seattle, Wash.

Robert E. Cutter — Los Angeles, Calif.

Shawn Jack — Ooreville, Ill.

John R. Spencer — Lancaster, Penn.

George A. Rost — Lawndale, N.C.

Congratulations and thank you for your submissions.

Addition

With the fun part over, it's time to get back to arithmetic. As you know, your editor/assembler has several mathoriented operation codes. And, despite my reluctance to admit it, additions and subtractions are the foundation of assembly language programming.

Either an 8- or 16-bit operation is 6809 addition that adds the contents of a register to a specified number or memory location. The operation can use either accumulator 'A' or 'B', in 8-bit functions, or both 'A' and 'B' (register 'D'), in 16-bit functions. The following example demonstrates the ADD operation:

00100 START	ORG	#\$7000	
00110	LDA	#50	*PUT 50 IN A
00120	STA	\$400	*STORE AT
\$400			
00130	LDA	#100	*PUT 100 IN
A			
00130	ADDA	\$400	*ADD
LOCATION \$400 TO A	1		
00140	STA	\$402	*STORE THE
RESULT AT \$402			
00150 END	SWI		
00160	END		

I chose memory location \$400 and \$402 to store the values of 50 and 150 so you can see what is going on. Hex 400 is the beginning of the text screen, and anything stored there appears at the top left-hand corner of your video screen. Memory location \$402 is two columns to the right on the top row of your screen. Of course, the program moves too fast to see anything but the result, which is the storage of 50 and 150 at the top of the screen. The value of 50 is represented by a reverse number 2 and 150 is represented by a graphic symbol.

Use the AO (absolute origin) switch to assemble the program to memory. Then, to test the program, type 'Z' to enter ZBUG. Press CLEAR so the screen won't scroll, then type GSTART to run the program. You can verify the display screen results by typing 'R' to examine the registers. Remember the register values are in Hex.

The Direct Approach

As well as using the ADD op code in extended addressing, you can also use it in direct addressing, such as this program:

00100	ORG	\$7000	
00110 START	LDB	#72	*LOAD B WITH
72			
00120	STB	\$400	*STORE B AT
\$400			
00130	ADDB	#1	*ADD 8 TO
THE VALUE IN B			
00140	STB	\$402	*STORE THE
RESULT OF THE ADD IN	\$400		
00150	SWI		
00160	END		

In this case, one is added directly to the value already stored in accumulator 'B'. Lines 120 and 140 are only included so you can see the results of the operations.

Adding More Bits

While 8-bit additions can be accomplished in either the 'A' or 'B' register, 16-bit additions require both 'A' and 'B', or the 'D' register. To see how 16-bit additions work, try this program:

00100	ORG	\$7000	
00110 START	LDD	#\$332B	
00120	STD	\$400	
00130	LDD	#\$343D	
00140	STD	\$402	
00150	ADDD	\$400	
00160	STD	\$4004	
00170	SWI		
00180	END		

Load and execute the program as before. Again,

additions in the 'D' register can be either extended or direct. In the above operation, the Hex number 332B is loaded in 'D', then 'D' is stored in memory location \$400. This puts \$33 in location 400 and \$2B in location 401. Then \$343D is loaded in 'D' and 'D' is stored in \$402. This puts \$34 in 402 and \$3D in \$403.

The number stored at \$400 and \$401 is then added to the number in 'D' and the result is stored at \$404. Again screen memory is used for storage so you can see the results.

A Bit of Subtracting

I am pleased to announce that subtraction works exactly like addition, except! The "except" is a fairly major one, however, and introduces an important concept in computer number handling.

But, before we get into the complicated, let's look at some of the things that are easy. The following program accomplishes a simple subtraction, using a memory location and the 'A' accumulator.

00100	ORG	\$7000	
00110 START	LDA	#100	*LOAD 100 IN A
00120	STA	\$400	*STORE A AT
\$400			
00130	LDA	#200	*LOAD 200 IN A
00140	SUBA	\$400	*SUB THE VALUE
AT \$400 FROM THE V	ALUE IN A	1	
00150	STA	\$402	*STORE THE
RESULT AT \$402			
00160	LDB	#255	*LOAD 255 IN B
00170	SUBB	#55	*SUBTRACT 55
FROM THE VALUE IN	В		
00180	STB	\$404	*STORE THE
RESULT AT \$404			
00190	SWI		
00200	END		

This program first loads accumulator 'A' with the value of 100. The value is then stored in memory location \$400. Next 'A' is loaded with the value of 200, then the value at memory location \$400 is subtracted from 'A' to give a result of 100. This is stored at memory location \$402.

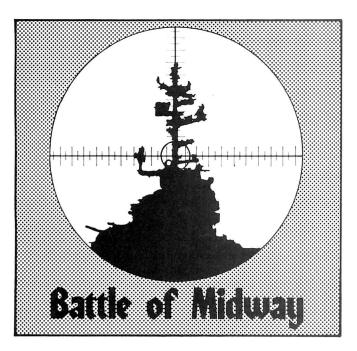
Next, 'B' is loaded with a value of 255. Then the value of 55 is subtracted directly from 'B', leaving a value of 200, which is subsequently stored in memory location \$404.

So far everything appears to operate the same as in addition. But what if the number subtracted from a register is larger than the value in the register? How does your computer handle negative values? So far we have been working with "absolute values," but as my accountant well knows, computers have to be able to handle negative amounts.

Two's Complement

The secret to handling negative numbers lies in a procedure called "two's complement." In the two's complement format, the most significant bit (the leftmost bit) of a binary value is set aside as a "sign bit." That is, if the MSB is zero, then the number is positive and, if the MSB is one, the number is negative.

To calculate a negative value using two's complement, first subtract the numbers using normal methods, then change all of the binary ones to zeros and all the zeros to ones and add one. This is purely a mechanical process that gives the proper result. Before showing exactly how the mechanical calculations work, however, let's delve into a bit of theory.



CINC PAC — Battle of Midway 32K

Ark Royal's masterpiece game of naval strategy of perhaps the most important battle in the history of the United States Navy. Hi Res graphics, 75% machine language allows player to control as many as 41 separate units on the screen at one time. Command Task Forces 16 & 17 as they play cat and mouse with the Japanese fleet. Maneuver the Hornet, Yorktown and Enterprise into the best position. Set courses and launch search and attack aircraft then hope for the best. Find the enemy fleet, then pick the targets: Akagi, Soryu, Kaga, Yamato and others in this historically accurate game. Relive history, Admiral, and it won't be any easier this time around. Anchors Aweigh.

Game save. Requires disk version to operate on disk. Cassette \$27.95.



COMPANY COMMANDER 32K

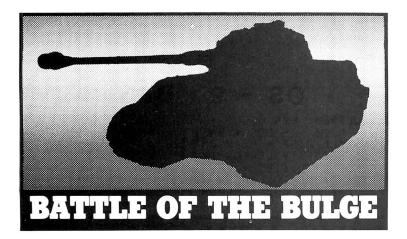
Game module 1 — House to House. Ark Royal's squad level WWII infantry combat game.

They said it couldn't be done — a SQUAD LEVEL wargame on a computer — but we've done it. The Line of Sight problem is licked — and the machine language routines really speed things up.

Game Module #1 comes with House to House map and 10+ scenerios involving infantry combat in Aachen, Caen, Arnheim, Stalingrad and other famous WWII city battlegrounds. Combat units include rifle squads, mortar teams, machine gun crews, engineers, and more (depending on the scenerio chosen), leaders, vehicles and other weaponry of WWII. Unique design allows incorporation of future expansion modules.

Choose campaign play and put yourself on the battlefield, Corporal Smith or Jones; collect points toward promotion. Order up smoke from the mortar squad, HE for those dug in units. Take the objective and you might make Major someday. Just don't step on a land mine.

Comes with House to House game map, more than 10 scenerios, on 2 cassettes, or all on 1 disk...\$29.95. (Disk included.)



BATTLE OF THE BULGE 32K

Ark Royal's 1 or 2 player game by the author of Battle For Tunis, Bulge recreates operation **Wacht Am Rhein**, Hitler's last desperate gamble of WWII. In none of our games is the fog of war so apparent than in BULGE. You know the Germans have attacked in the Ardennes, but little else. What is their strength? Their objective? Who do you send to repair the huge gap in the American lines? What bridges do you blow? Can you protect the fuel depots? Where are all those Tigers coming from? When will the weather clear?

Historically accurate, and a real challenge whether it be against the computer or a friend. (Just don't humiliate him too badly.) A game you've been waiting for. Cassette \$25.95.

OTHER ARK ROYAL GAMES... Some at reduced prices!

Across the Rubicon 32K (Feb '84)* \$24.95	Waterloo 32K (Mar '84)* \$22.95
Across the Rubicon 16K	Guadalcanal 32K \$24.95
(Dec '82)* \$14.95	Battle For Tunis \$24.95
Mission: Empire 32K (Oct '82)* \$22.95	Legatus (Disk only) \$29.95
Mission: Empire 16K* \$17.95	Kamikaze 32K
Galactic Taipan 32K	(Apr '83)* \$19.95
(May '84)* \$17.95	Kamikaze 16K \$14.95
Starblazer 32K (Apr '84)* \$17.95	* Denotes Rainbow review

ARK ROYAL GAMES

P.O. Box 14806 Jacksonville, FL 32238 904-786-8603

Bomber Command 16K (Jan '84)* \$22.95



month

Prices on all games include shipping. Florida Residents add 5% tax. All games available on disk, add \$3.00. All programs shipped within 24 hours regardless of check or money order. We pay shipping to U.S. and Canada. Others add 10%. Dealer inquiries invited. COD's accepted. All Programs require Color ComPuterTM (Tandy Corp) or TDP System 100 ComPuterTM (RCA).

When you reserve the MSB of a binary number as a sign bit you have actually reduced the value that number is capable of storing by half. To see this, look at the 8-bit binary number 111111111. This number in decimal is 255, 128+64+32+16+8+4+2+1. When you reserve the first bit as sign bit you have the binary number 11111111, or 127 in decimal.

In fact, some computers represent numbers in this way. On the Radio Shack Model 3, numbers above 32,768 are represented as negative numbers. The highest memory location is -1, rather than 65536. There isn't room to show you how such a number is formatted but, using a maximum value of 19 rather than 65536, the following chart shows how you can count to 19 with such a method:

With this method, -9 now represents 11, -5 represents 15, and -1 represents 19.

To show you how two's complement can accomplish the job of subtracting, let's subtract the binary number 10 from 5. In decimal, it looks like this:

In 6809 binary, when the two numbers are subtracted, the result is:

So far, aside from the number being negative, things don't look too good. But, let's do a two's complement operation on the result to complete the operation:

```
0100 Swap 0's for 1's and 1's for 0's
+1 Add 1
----
0101 5 decimal
```

That looks better and, even more impressive, it is correct. For simplicity in this example, only 4-bit numbers were used. The process is exactly the same for larger, 8-bit or 16-bit numbers, however.

By now you probably wonder how your 6809 knows whether you are operating in two's complement mode or in absolute numbers. The answer to the question is that it doesn't, but you do (at least you should). Just to be on the safe side, the 6809 always acts as though two's complement is being used and outputs the necessary information. If you don't need two's complement, you can ignore the signs that the processor sends out. If you need two's complement, you can make use of the signs.

1 - DRIVE REPAIRS - MONITOR - PRINTERS - COMPUTER REPAIR - UP GRADES - DRIVE REPAIRS - 1

☆☆ DISC DRIVE SALE ☆☆

BARE DRIVES FROM TEAC

1/2 HEIGHT SINGLE SIDED - DOUBLE DENSITY 40 TRACK 6ms STEP RATE

\$1

1/2 HEIGHT SINGLE SIDED - DOUBLE DENSITY 40 TRACK 6ms STEP RATE
1/2 HEIGHT DOUBLE SIDED - DOUBLE DENSITY 40 TRACK 6ms STEP RATE
1/2 HEIGHT DOUBLE SIDED - QUAD DENSITY 80 TRACK 6ms STEP RATE
1/2 HEIGHT DOUBLE SIDED - QUAD DENSITY 80 TRACK 6ms STEP RATE
1/9.95
MANUFACTURES WARRANTY

CASE AND POWER SUPPLY FOR TWO HALF HEIGHT DRIVES

TWO DRIVE (#0,#1) SYSTEM WITH CASE, POWER SUPPLY WITH DISK CONTROLLER PACK AND CABLE

265.95 375.00 PRINTERS

COMPUTER

REPAI

S

GR

AD

1

COMPUTER

REP

84.95

MONITOR/PRINTER DRIVER

LEAVES SERIAL PORT OPEN * CLEAN AUDIO CENTRONICS COMPAT. * 110 - 9600 BAUD COLOR OR MONOCHROME * NO SOLDERING FITS INSIDE COMPUTER * HI TECH DESIGN ??? WHY BUY TWO DIFFERENT DRIVERS ??? GET * BOTH * IN ONE PACKAGE FOR ONLY *** \$69.95 ***

OS - 9 BBS

REQUIRES: 64K COCO * 2 35 TRACK DRIVES
OS - 9 DOS * BASIC O9 * SMART MODEN
INSTALL DISK * MENU DRIVEN * 8 SUB BCARDS
255 SECURITY LEVELS * PRIVATE MESSAGES
SYSOP UTILITIES * UP - DOWN LOAD FUNCTION
EXPANDABLE TO LARGER MULTI - DISK SYSTEM
40 o/o DISCOUNT COUPON FOR SDISK INCLUDED
*** \$149.95 ***

NEW DISC DRIVE UTILITY

WILL ADDRESS ANY COMBINATION OF 35, 36, 40, OR 80 TRACK SINGLE OR DOUBLE SIDED DRIVES -- UP TO THREE 80TRK DSQD COMPATIBLE WITH RS 1.0 OR 1.1 DISK BASIC AND MOST PGMS. DIFFERENT STEP RATES ON EACH DRIVE * WILL FORMAT TRACKS 35-39 ON PRESENT 35 TRACK DISK * MANY NEW COMMANDS AND FUNCTIONS (LOCK-UNLOCK-BAUD-ECHO-DOS-KLICK-AUTO-) ETC. REQUIRES 64K OR 16,32,64K WITH EPROM VERSION * HAVE THE DOS THAT SHOULD HAVE COME WITH THE COCO FOR ONLY \$29.95

Bee Color Computer PO Box 5609 Aloha, Oregon 97006 503-649-4497 Voice 503-629-8343 BBS Check Visa or COD Mail for Catalog Dealer Inquires Invtd.

1 - DRIVE REPAIRS - MONITOR - PRINTERS - COMPUTER REPAIR - UP GRADES - DRIVE REPAIRS

240

AD

P

COMPUTER

To see what happens with such an operation, type in and assemble the following example:

00100	ORG	\$7000	
00110 START	LDA	#100	
00120	STA	\$E00	
00130	LDA	#50	
00140	SUBA	\$E00	
00150 END	SWI		
00160	END		

Use ZBUG to run the program as you did on the earlier examples. When you have run the program, type 'R' to examine the registers.

Remember several months ago when I told you that you could ignore the Condition Code register for awhile? Well, now you need to know that the flags for negative operations are kept in the Condition Code register. The best way to see this is to execute the program again, but this time single step through it.

To single step, first assemble the program in memory without errors. Then go to ZBUG and type START,. The comma tells ZBUG you want to single step the program beginning at START. Enter a comma every time you wish to implement a new step.

After each step you can look at the registers by entering 'R'. Examine the registers after lines 00110 and 00140 (remember, the last line displayed in the single step mode is the next one to be executed). At Line 00100 you get a register display similar to the following:

```
#Z
#R
A = 64 B = 00 DP = 00 CC = 81 = EC
X = 0000 Y = 0000 U = 0000 S = 0000
PC = 700A
```

You need to pay special attention to the condition code flags. At this stage flags 'E' and 'C' are set (CC 81 EC), but neither of these flags are of concern to us now. Next, step through Line 00140 and examine the registers again. The display should now look like this:

```
#Z
#R

A = CE B = 00 DP = 00 CC = 89 = ENC
Bytemaster Column
Article Number 7

X = 0000 Y = 0000 U = 0000 S = 0000
PC = 700A
```

A new condition flag is now set, the 'N' flag. If a subtract operation results in a negative value, the 'N' flag is set. If a subtract operation results in a zero, the 'Z' flag is set. If the result is positive, neither 'N' nor 'Z' is set. A flag is considered set if it equals one and is considered reset if it equals zero.

The subtract operation is now complete, but you can see that register 'A' does not hold the correct answer. Subtracting 100 from 50 should not give a result of \$CE or 206 decimal. Now two's complement can save the day. To get the right answer, add two more lines to your program:

00142	COMA		*COMPLEMENT A
00144	ADDA	#1	*ADD 1 TO A

In the subtract operation, knowing that the CC 'N' flag is set lets you know the resulting value must be complemented and increased by one to get the right answer. Executing the program after the addition of these lines produces the right answer (50 decimal or 32 Hex) in the 'A' register.

Next month we will complete the look at addition and subtraction operations, and delve into comparison operations, multiplication and division. For now, experiment with addition and subtraction as far as we have gone and feel free to strike out on your own. The things you discover for yourself will be remembered much longer than those things you read about in a book.

Although we are not yet far enough along, Chris and I are working on some more neat programs to give you practical examples of what you are learning.

You can contact either Chris or me by writing or calling: 2251 Lipscomb, Fort Worth, TX 76110; Phone (817) 924-3725.

UNDIRCOLOR

Finally, a newsletter that will keep you up to date on the latest Color Computer Developments.

compater beveropments.
SUBSCRIBE TODAY!
☐ Yes, enter my subscription to UNDERCOLOR ☐ 1 year \$33.00 ☐ 2 years \$66.00 Canada/Mexico ☐ 1 year \$47.00 ☐ 2 years \$94.00 Overseas ☐ 1 year \$53 US dollars ☐ Airmail \$65 US dollars
Name
Address
City State Zip
Mail to: ColorPlus, Box 6809, Roxbury, VT 05669 or

call (802)485-6440

RAINBOWIECH



Downloads/Dan DownardAnswers to your technical questions	244
Personable Pascal /Daniel A. EasthamBuilding a program a piece at a time	247
KISSable OS-9/Dale PuckettAn overview of programs, corrections and more	256
Restoring OS-9 Files/Brian A. Lantz Now you can recover that deleted file	265

Introducing Volksmodem

TALK/DATA SWITCH FULL/HALF DUPLEX SWITCH LINE JACK INTERFACE CABLE TO YOUR COMPUTER

REG.\$99 PHONE JACK ONLY

> Data Format Operate Mode

Data Rate WALLOUTLET

Modulation

Data Interface

Outputs

Inputs

SPECIFICATIONS RS-232C compatible

MARK (OFF) -4.0V min (typical) SPACE (ON) +4.0V min (typical)

MARK (OFF) 0 to -25V SPACE (ON) +2.5 to +25V

Serial, binary, asynchronous

Manual dial, manual answer, automatic answer/originate mode select

0 to 300 bps, full duplex or half duplex

Phase coherent, frequency shiftkeyed (FSK)

Includes cable for color computer

GET ON LINE FOR \$85



(SUPPLIED SEPARATELY)

AUTOTERM

MODULAR

PLUG

TURNS YOUR COLOR COMPUTER INTO THE

WORLD'S SMARTEST TERMINAL!

YOU'LL ALSO USE AUTOTERM FOR SIMPLE WORD PROCESSING & RECORD KEEPING.

Cassette \$39.95

Diskette

Total Communications Capability Send/Receive Text, Graphics, & ML Programs

Scroll, Search, Edit, Load, Save while On Line

Built-in Word Processor

HI-RES Lower Case is Optional & Fast

Screen Widths of 32, 40, 42, 51, & 64

Many Printer Options

Optional Key-Beep & Error Beebop

Automatic Block Graphics

Unbelievable Keystroke Multiplier Abilities

THE BEST

YOU CAN BUY

SPECIAL PACKAGE PRICE

Volksmodem™ & AUTOTERM



Basic transportation for data. \$150 VALUE

COLOR TERM + PLUS +

Now even more + PLUS + features than before!!! (TAPE) (DISK) New and Improved!!

An Intelligent Terminal Program For The Color Computer or TDP 100.

- Communications BAUD rate: 110-19200
- Change printer BAUD rate: 600-9600
- Select printer line feeds if needed Select Half or Full Duplex
- Select Odd, Even, or No Parity
- Select 7 or 8 Bit Words
- Select I or 2 Stop Bits Send Control Characters
- Separate Keys for Escape & Delete (Rubout)
- Turn off those UGLY Lower-case letters Word Wrap - eliminate all solit words
- Selectable Reverse or Normal Video

GOLOBGOM / B

838.86 SMART TERMINAL PACKAGE

- Complete Upload and Download Support
- Online Cassette/Disk Reads 110, 300, 600, or 1200 Bould
- Full or Holf Duplex
- Pre-in-Park Data Bulare Calling (Saves \$5's)
 Office and Online Scrolling
 ROM Pack or Disk
- . Automatic Copluse of Files

- Automatic Copture of Files
 Send All 177 ASCII Characters from Keyboord
 Vord Mode Einninates spill Words
 7 or 8 Data Bits (Including Graphics Support)
 Efficient Data Storage 5-11-e-1-e-t-he-s Memory
 100% Compolible w/Mainbow Connection 1853 is
 Dek Venun-6-1K and 14 (Nes scrown now available)

\$49.95 COLORCOM/E

ORDERING INFORMATION

A GREAT

BUY!

ADD \$2.00 PER ORDER FOR SHIPPING

WE ACCEPT VISA, MASTERCARD, CHECKS, M.O. C.O.D. ADD \$3.00 EXTRA.

California Residents, Add 6%

Sales Tax to Orders

Sale Price Good Thru 3/31/85



(916) 726-8793



Citrus Heights, CA 95610



6201 C Greenback Lane

RAMBOWTECH

DOWNLOADS

A Cure For The Baud Bug

By Dan Downard Rainbow Technical Editor

This letter is prompted by a question in your December column concerning running a printer at 9600 Baud under OS-9. I purchased OS-9 several months ago and found the bug in question right away. I notified Tandy Software Support and supplied them with the correction, but apparently they have not made it available to users yet (probably because their printers do not run above 2400 Baud!). I am sure many of your readers would appreciate the following information. You are free to use it as you see fit, however, I would ask if you publish it to please mention where you got it (like many of us, I enjoy seeing my name in print occasionally).

For those who are interested in the more technical aspects, the problem results from errors in the Baud rate delay table in the OS-9 device driver module PRINTER (one more example of the disadvantages of a "bitbanging" serial port). The delay counts for 4800 Baud and 9600 Baud are just a bit too large, causing the software to elongate

the bit time to the serial port.

This occasionally causes the printer (specifically its serial interface) to lose bit synchronization and see two zero or one bits in a row when OS-9 only intended to send one. This smattering of extra bits is what fouls up the transmission of the characters enough to cause the garbage on the printer at rates above 2400 Baud. The original counts and my corrected counts are as follows:

 4800 Baud
 9600 Baud

 Original
 \$0016
 \$0008

 Corrected
 \$0014
 \$0006

I have tried the 4800 Baud setting without difficulty, and I have been driving my Gemini 10-X at 9600 Baud under OS-9 for

(Dan Downard is an electrical engineer and has been involved in electronics for 24 years through ham radio [K4KWT]. His interest in computers began about five years ago and he has built several 68XX systems.)

several months now with no problems whatsoever. I have used XMODE and COBBLER to alter my boot file so the default Baud rate for | P is 9600, allowing me to alternate between OS-9 and Radio Shack Disk BASIC without changing any settings (I have a system initialization program that, among other things, sets the BASIC Baud rate to 9600, also).

Fixing the problem is very simple. The following list of commands contain a step-by-step scenario for changing the constants and creating a new bootfile. Of course, make sure you apply the fix to a copy of your OS-9 disk. After booting from the corrected disk, TMODE and XMODE settings of 4800 or 9600 Baud for device | P should function properly.

One important note of caution: Be careful that any software that modified itself or other OS-9 modules dynamically is not active when you execute the COBBLER command. If it is, it can result in a non-bootable disk! One package I have that does this is the Hi-Res screen in O-PAK from Frank Hogg Labs. If you have it, make sure Hi-Res is not in the system while you apply

this fix. Afterward, you can start Hi-Res again.

OS9: DEBUG <ENTER> INTERACTIVE DEBUGGER DB: L PRINTER (ENTER) EADF 87 DB: . .+6A <ENTER> EB49 16 DB: =14 (ENTER) **EB4A 00** DB: - (ENTER> EB49 14 DB: . .+2 (ENTER> **EB4B 08** DB: =06 (ENTER) EB4C 34 DB: - (ENTER) EB4B 06 DB: . . +5A CENTER> EBA5 31 DB: =6F <ENTER> EBA6 6E

```
DB: =76 (ENTER)
    EBA7 57
DB: =AA <ENTER>
    EBA8 87
DB: . .-3 (ENTER)
    EBAS 6F
DB: <ENTER>
    EBA6 76
DB: <ENTER>
    EBA7 AA
DB: O KENTER>
OS9: IDENT PRINTER -M (ENTER)
HEADER FOR:
             PRINTER
MODULE SIZE: $0009
                       #201
MODULE CRC:
              $6F76AA (GOOD)
HDR PARITY:
              $12
EXEC. OFF:
              $0016
                       #22
DATA SIZE:
             $001F
                       #31
EDITION:
             $01
                       #1
TY/LA AT/RV: $E1 $81
DEV DVR MOD. 4809 OBJ, RE-EN
OS9: COBBLER /DO <ENTER>
WARNING - FILE(S) OR KERNEL
PRESENT ON TRACK 34 - THIS
TRACK NOT REWRITTEN.
059:
```

Christopher Blum Nova, OH

Thanks for the tips, Christopher. I guess I caused a little confusion by not distinguishing between input and output when discussing timing. You can indeed use this patch to correct the printer Baud rate, but it is not applicable for remote input, such as from the RS-232 port.

CREATE BUFFERS WITH OS-9

• I own a Color Computer and a disk drive, I am interested if there is a way, with software, to give the CoCo a keyboard buffer like IBM computers have? You have a great magazine, keep it up.

Victor Capton Troy, MI

A keyboard buffer is available for your

CoCo using OS-9, Victor. Color BASIC uses a method of keyboard input called polling where the keyboard is scanned at intervals for a key depression. To enable a keyboard buffer, the hardware, and software, inside your CoCo would have to be changed.

Buffers usually are based on what is called interrupt-driven software. When a key is depressed using this scheme, an interrupt vectored subroutine inputs the character into a buffer. This takes a small amount of time. Since, in Color BASIC, software timing is used for all I/O, it is impractical to use interrupts. The other alternative is hardware devices such as ACIA's, which would raise the price of the computer.

CLANG, CLANG, CLANG GOES THE DISK DRIVE

• Why is there so much grinding and assorted noises on my disk drive (Radio Shack's CoCo 2 drive)? Why, occasionally, do I get the directory quickly with no noise and most often with all that clanging? Is there a remedy for this — a nice short poke to silence it or make it sound like it's not breaking up?

Why, sometimes, do I get that I/O Error when I load a program that loaded OK five minutes ago, then loads OK five minutes later? I'm so scared of crashed disks and lost programs, that I make at least three backups of every program I save.

By the way, my drive is not broken in any way, and I've experienced this on other drives, too (all the same!).

Barry Hornstein E. Rockaway, NY

The clattering you are hearing in your disk drives, Barry, is the head inside the drive seeking the proper track.

This also accounts for the fact that you don't hear any noise when asking for a directory. I would bet you just asked for a directory with the previous command. Since all of the information required for the DIR command is on Track 17, the heads do not have to move.

The majority of I/O Errors I've encountered on disk systems are caused by dirty contacts between the controller and the CoCo, and speed variations of different disk drives. Since you indicate the program previously loaded, I would suspect dirty contacts. Try cleaning them with a pencil eraser.

I'd like to know where you are buying disks. You must be getting a good price if you can afford to keep three backups of all your programs. Good Luck.

DOWNLOAD DIRECTIONS

• Is there a manual or a book somewhere that explains the steps to do a download from the Color SIG in CompuServe?

Michael Smith Colorado Springs, CO Michael, the next time you're on the Color SIG, try reading the XA0 database. The last time I was on, it gave a complete description of the various CompuServe download protocols.

If you would like a manual of Special Interest Group (SIG) instructions, ask for a copy of CS-507 from CompuServe. This will not solve your problem, but contains the commands necessary to access the databases.

COCO/M100 WORK TOGETHER

• I would like to thank you for all your great articles found in THE RAINBOW, and your sister publication, PCM for the M100 owners.

I have a problem and I need your help. I own a TRS-80 Color Computer 2, 16K ECB and a TRS-80 Model 100. I am considering expanding my CoCo to 64K and adding a disk drive. I would like to know if I can use the disk storage of the CoCo with my M100. I would like to be able to store text files from my 100 on the disk of the CoCo and not use the cassette storage for the 100. Is this possible? If so, how?

Frank Hatchett Bowling Green, KY

The immediate solution that comes to mind, Frank, is using your Model 100 as a remote terminal for your CoCo. This would require running OS-9 on your CoCo. Files could be stored on your CoCo disk with no problem. The drawback of the setup is speed, since all communications would be at 300 Baud.

Another solution is to use a terminal package on your CoCo and download files as necessary with your Model 100.

UNDOCUMENTED COMMAND

• I am the owner of a 64K CoCo with Disk BASIC 1.0. When I enter CDPY "programname.bas" the screen prompts me to enter a destination diskette. Is this an undocumented single drive copy command or an error in Disk BASIC source code? Charles Bateman

Independence, MO

Yes, Charles, the single drive COPY command is not documented in the Radio Shack manuals. To use it, just type COPY "filename/ext" and follow the prompts.

MIXED UP ABOUT MODEMS

• I have a 32K CoCo, but I do not have a modem and I am not into electronics especially computer electronics. I am confused about modems.

I do not understand why a modem cannot "talk" to any other modem, and thus why a computer equipped with a modem cannot "talk" to any other modem-equipped computer via telephone lines. It is my

understanding that a modem converts the electrical signals/information from the computer to which it is attached into signals that can be transported/handled by a telephone receiver line. Or conversely, that a modem converts signals received from a telephone line into those that its computer can use

If all of the signals handled by telephone lines are the same and the conversions are carried out before or after the signals reach the telephone line, where is the incompatibility?

By the way, with respect to Mark Azar's scrolling problem, using INKEY\$ instead of INPUT prompts on the bottom line of the screen allows a user to make lots of wrong responses without the display scrolling up.

Paulette Grantham Palo Alto, CA

Thanks for the tip on the use of INKEY\$, Paulette. The question is hard to answer in a short column, but I will try to give you the basics.

There are several different types of communications protocols available on the telephone lines. The most common is the Bell 103, which defines the frequency of the tones for answer and originate, and the Baud rate, which, by the way, is 300 Baud. This designation just happens to correspond to the data set made by AT&T for this type of protocol. If you buy a Modem I from Radio Shack it follows this standard.

Then, there are 1200 Baud modems. I am aware of two different methods of transmission, tones and phase shift. The most common type of 1200 Baud protocol is the phase shift method, or the Bell 212 standard.

The only thing a modem does is convert the digital information from your computer to tones, so information can be transmitted on normal voice lines.

The incompatibility is introduced both by the protocol of the modem you are using and the information you are exchanging. In most cases it is ASCII text, which presents no particular problems, but some computers (and terminals) use different control codes than others. Then there are buffer control codes such as XON/XOFF handshaking.

It's a wonder any communication is accomplished at all with all of the different variables involved. Don't get discouraged, though; you can talk to almost any other computer you want with your CoCo, given the proper software. Most advanced terminal programs explain the above features as well as make them user-definable. So, if you know what type of computer you want to talk to, it shouldn't be too much of a problem.

Your technical questions are welcomed. Please address them to: Downloads, THE RAINBOW, P.O. Box 385, Prospect, KY 40059. We reserve the right to publish only questions of general interest and to edit for space and clarity.

SOUTH EAST MEDI

TOLL FREE 1-800-338-6800 For Ordering

CoCo OS-9TH FLEXTH Free Diskette with Each \$50 Purchase

COMPILERS

FLEX-Based COBOL Compiler, Level I System

CCF - \$99.95

K-BASIC - A BASIC Language to MACHINE Language Compiler; CCF - \$199.00 includes an Extended Macro Assembler.

PL/9 - by Graham Trott. A combination Editor/Compiler/ Debugger; Structured Programming at the "almost Assembly Language" level.

CCF - \$198 NO. CCF - \$198.00

WHIMSICAL - Recursive Descent Compiler provides the tool for developing simple Utilities to MAJOR Systems in a "Structured, almost Assembly Language" environment. CCF - \$195.00

Windrush C Compiler by James McCosh - Full featured C Compiler

INTROL C Compiler - Full Featured C Compiler, Linking Loader includes full Library Manager. CCF - \$375.00

LUCIDATA PASCAL Compiler

-Code Compiler, follows ISO Standard.

CCF - \$190.00

OmegaSoft PASCAL Compiler

the "Software Systems Designer"; ISO Based Pascal, produces ROMable Native Code, full Library Manager, Compiler only uses portions of the Libraries that are called by the Program, etc. Requires a Relocating Assembler.

PURE COCO

Stearns Electronics FORTH - the BEST CoCo FORTH Package we have seen. Excellent primary "Dictionary" written in ML for SPEED; system even provides access to Interrupts. Includes a High-Res FORTH Editor. Provides "Trace" Modes, watch the "Data Stack", etc. Excellent system for learning FORTH!

Color Computer TAPE, transferable to Disk - \$58.95

Custom Software Engineering, Inc.

Color Computer GRAPHIC SCREEN PRINT Programs for various CoCo TAPE - \$7.95 to \$9.95 Printers. DATE-O-BASE CALENDAR Program - A Menu Driven Graphic Calendar. TAPE (4000 Memos) - \$16.95 DISK (4000 Memos) - \$19.95
INTEREST-ing - Interest calculator. TAPE - \$29.95 That's INTEREST-ing - Interest calculator. DISK DATA HANDLER 64K - CoCo EXTENDED BASIC Data Management System w/Mach. Lang. Routines. DISK - \$54.95
DISK DOUBLE ENTRY - CoCo DISK EXTENDED BASIC Accounting Program w/Mach. Lang. Routines. DISK - \$44.95

DATA BASE'S

XDMS - 'Mainframe' User's say "We don't have anything NEARLY as powerful as XDMS"; pure Assembly Language, F-A-S-T and small enough to operate on a single sided 5" disk. XDMS Lv1 II - CCF - \$199.95

XDMS Lvl I - CCF - \$129.95 XDMS Lvl II - CCF - \$199.95 XDMS Lvl III - CCF - \$269.95 XDMS System Manual only - \$24.95

BUSINESS

Accounting Software, Inventory, Data Base Systems, Business Analysis Software, Electronic Spreadsheets, etc., etc.

Call for more Info.

UTILITIES

BasicO9 XRef - Cross Reference Generator for OS-9 BasicO9 Programs; requires Basic09. CCO - Obj. Only -- \$39.95

CCO - w/ Source - \$79.95

0-F - transfer OS-9 to FLEX -- FLEX to OS-9: The ORIGINAL transfer Program. Runs under OS-9, requires BasicO9.

CCO - \$79.95

LUCIDATA PASCAL UTILITIES - Requires LUCIDATA Pascal ver 3. XREF -- produce a Cross Reference Listing of any text; CCF - \$25.00 oriented towards Pascal Source. INCLUDE -- include other Files in a Source Text; has unlimited nesting capabilities. Also allows Binary File inclusions.

PROFILER -- produces an Indented, Numbered, "Structogram" of a Pascal Source Text File. Supplied in Source requires CCF - \$25.00

DISK UTILITIES - Eight FLEX Assembly Lang. Disk Utilities and ten FLEX XBASIC Utilities; all Source included.

CCF - \$50.00

ASSEMBLERS

ASTRUKO9

A "Structured Assembler for the 6809". Allows direct use of structured statements such as IF, ELSE, DO, REPEAT, program indentation, etc., with the TSC Macro Assembler.

TSC Macro Assembler - the FLEX STANDARD! Special -- CCF \$35.00 TSC Editor Special -- CCF \$35.00

Relocating Assembler/Linking Loaders available.

CCF - \$125 to \$240 -- Call for Info!

MACE Editor/Assembler by Graham Trott.

DISASSEMBLERS

SUPER SLEUTH - Interactive; extremely POWERFUL!! Disk File Binary/ASCII Examine/Change, Absolute or FULL Disassembly. XREF Generator, Label "Name Changer", and Files of "Standard Label Names" for different Operating Systems included. CCD (32K Req'd) Obj. Only \$49.00 CCF, Obj. Only \$50.00 CCO, Obj. Only \$50.00 CCF. w/Source \$99.00

DYNAMITE + - Excellent standard "Batch Mode" Disassembler.
Includes XREF Generator and "Standard Label Names" Files.
CCF, Obj. Only \$100.00 CCO, Obj. Only \$59.95

(WORD PROCESSING)

SPELLB "Computer Dictionary" OVER 120,000 words! Provides 'Lookup" Mode. CCF - Special \$99.95

JUST Text Formatter - Designed for formatting Text Output for Dot Matrix Printers. CCF - \$49.95

STYLOGRAPH - A full Screen-oriented WORD PROCESSOR (what you see is what you get); also supports the Daisy Wheel proportional printers. SPECIAL CCF - \$95.00

Other Word Processors, Dictionaries, etc., avaliable.

Call for more Info.

TSC Assembler NOW \$35.00

> TSC Editor NOW \$35.00

FLEX COCO ST.

Complete with Manuals 79.18

Complete with Only 179.18

Red 250... FLEX.CoCo St.

STAR-DOS PLUS + Functions Same as FLEX

• Reads - writes FLEX Disks

• Run FLEX Programs • Just type: Run "STAR-DOS"

Over 300 utilities & programs

to choose from



for Free Catalog





** SHIPPING ** Add \$2.00 U.S.A. Add 5% Foreign Surface Add 10% Foreign Air





134 5

Hixson, TN 37343 info (615) 842-4601

Availability Legends -CCF = Color Computer FLEX

CCO = Color Computer OS-9 CCD = Color Computer Disk

CCT = Color Computer Tape



PERSONABLE PASCAL

Building A Program A Piece At A Time

By Daniel Adams Eastham **Rainbow Contributing Editor**

This month we are going to talk about a feature in DEFT Pascal which provides you with the ability to develop and compile an individual program in several smaller pieces, rather than as a single, large unit. While this separate compilation feature is not part of standard PASCAL, most PASCAL compilers (including PASCAL09, UCSD PASCAL and Microsoft PASCAL for the IBM PC) incorporate a form of it.

There are a number of advantages to developing a program in this manner:

1) You can develop a set of utility routines as a program "piece," and then incorporate that piece into many different programs.

2) You can take a large program with perhaps many sub-systems and make each sub-system a program "piece." This allows you to develop and test each

(Daniel Eastham holds a bachelor's

degree in computer science and has 14

years experience in systems and com-

sub-system individually before trying to put the whole thing together.

3) You can let more than one person work on an individual program at the same time by having each one develop his own "piece" of the program.

4) You can use more than one programming language in a single program by having each "piece" written in a different language. With the DEFT Pascal Workbench, the languages available are PASCAL and 6809 assembler.

Modules

The term *module* is used to describe one of these program pieces regardless of which programming language is used to develop it. At the same time, DEFT Pascal has a keyword, MODULE, which denotes a particular type of PASCAL module. In DEFT Pascal there are two types of modules:

- 1) A PROGRAM is a module that contains subroutines, variables and the main sequence of instructions to be executed by the overall program.
- 2) A MODULE is a module that subroutines and contains variables.

A complete program can be made up of one or more modules, but one of these (and no more than one) must be a PROGRAM module. As you can see, every program we have written so far has been developed as a single PRO-GRAM module.

We already know what the syntax of a PROGRAM module is. The syntax of a MODULE is almost the same:

MODULE <identifier>;

(constant declarations)

<type declarations>

<variable declarations>

(Procedure and Function declarations)

END.

The only differences between a MODULE and PROGRAM are that the MODULE does not have any parameters, nor does it have the BEGIN <executable statements> at the bottom like a PROGRAM does.

PUBLIC and EXTERNAL

The purpose of a MODULE is to provide variables, procedures and functions for use by the PROGRAM

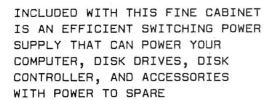
Inc.)

247

QUALITY HARDWOOD CABINET FOR YOUR COLOR COMPUTER

INSIDE THIS SOLID HARDWOOD CABINET YOU CAN INSTALL:

- * YOUR COLOR COMPUTER CIRCUIT BOARD
- * DISK DRIVE CONTROLLER
- * TWO HALF HEIGHT DISK DRIVES
- * ANY OTHER 5" X 7" CIRCUIT BOARD (SUCH AS AN 80 COLUMN VIDEO BOARD)



ALSO INCLUDED IS A SEPARATE
HARDWOOD KEYBOARD ENCLOSURE
WITH CONNECTING RIBBON CABLE
(SPECIFY YOUR KEYBOARD)

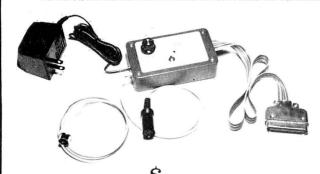


AVAILABLE IN YOUR CHOICE OF HARDWOODS:

OAK, MAPLE, CHERRY..\$ 189
WALNUT.....\$ 2Ø9
TEAK.....\$ 229

WE CAN INSTALL YOUR COMPUTER AND ACCESSORIES. WE ALSO CARRY TEAC DISK DRIVES AND J&M DISK CONTROLLERS AT COMPETITIVE PRICES. - CALL

PARALLEL PRINTER INTERFACE



MODEL CCP-2 84
(with modem switch & connector)

MODEL CCP-1

^{\$}69

UPGRADE YOUR CCP-1 TO A CCP-2 \$17 including shipping

- * RUNS ANY PARALLEL PRINTER FROM THE SERIAL I/O PORT
- * NO HARDWARE MODIFICATIONS OR SOFTWARE PATCHES NEEDED. WORKS WITH ALL STANDARD COLOR COMPUTER COMMANDS
- * SWITCH SELECTABLE BAUD RATES FROM 300 TO 9600
- * ALL CABLES AND CONNECTORS INCLUDED
- * 1 YEAR WARRANTY

Either Model without power module DEDUCT \$3.00.

Shipping costs included in price Mich. residents add 4% sales tax.

BOTEK INSTRUMENTS

313-739-291Ø 4949 HAMPSHIRE UTICA, MICHIGAN 48Ø87 DEALER INQUIRIES INVITED

and other MODULEs. The only problem is how the PROGRAM and other MODULEs reference these variables, procedures and functions. This *linkage* is accomplished via the attributes PUBLIC and EXTERNAL:

- 1) The PUBLIC attribute identifies those variables, procedures and functions which are defined within the current module (either PROGRAM or MODULE), and which are to be made available to other modules. These variables, procedures and functions then become publicly known.
- The EXTERNAL attribute identifies those publicly known variables, procedures and functions which are defined in other (external) modules, but which are going to be used in this module.

An Example Module

As an example, let's suppose we have a set of routines that prompt for and

"What the compiler does is generate a note to the linker that this module is referencing an item that is present in some other module . . . "

validate various types of data input from the keyboard. This is how we might construct the MODULE that contains these routines:

```
MODULE KeyboardData;
  TYPE Date = RECORD
                Month, Day, Year : Integer:
  VAR R : Real;
      I : Integer;
      C : Char;
  VAR PUBLIC
      ThisDate : Date;
  PROCEDURE DisplayError;
  BEGIN
    WRITELN ('** ERROR - OUT OF RANGE');
  END;
  FUNCTION GetPercent (Prompt : String) : Real;
  PUBLIC;
  BEGIN
    REPEAT
      WRITE (Prompt, ' (%) ');
      READLN (I);
      IF (I < 0) OR (I > 99) THEN DisplayError;
    UNTIL (I >= 0) AND (I <= 99);
    GetPercent := I / 100;
  END;
  FUNCTION GetYesNo (Prompt : String) : Boolean;
  PUBLIC:
 END;
 PROCEDURE GetDate (Prompt : String);
 PUBLIC;
    ... (* put result in ThisDate *)
 END;
END.
```

One-Liner Contest Winner . . .

This one-liner converts a decimal number to any base from two through 36. As with hexadecimal, the letters starting with 'A' indicate digits higher than nine, but now the entire range from 'A' to 'Z' is used (hence the limit of 36).

The listing:

1 IFB>1ANDB<37ANDB=INT(B)THENM=INT(N/B):S=N-M*B:R\$=CHR\$(-48*(S<10)-55*(S>9)+S)+R\$:N=M:IFN=0THENPRINTR\$:RUNELSE1ELSEINPUT"NUMBER";N:INPUT"BASE";B:IFN<00RN<>INT(N)THENB=0:RUNELSE1

Donald R. Boyce, Jr. South Amboy, NJ

(For this winning one-liner contest entry, the author has been sent copies of both *The Rainbow Book Of Simulations* and its companion *Rainbow Simulations Tane.*)

One-Liner Contest Winner . . .

This one-liner lets you draw a train of dots on the screen. Plug in a joystick (in the right jack) and try it!

The listing:

Ø FOKE65495,0:PCLEAR8:PMODE4,1:P CLS:PMODE4,5:PCLS:X=198:Y=96:FOR J=1T099999:FORI=1T08:PMODEØ,I:SC REEN1,1:A=JOYSTK(0):B=JOYSTK(1): X=X-2*(A>60):X=X+2*(A<3):Y=Y-2*(B>60):Y=Y+2*(B<3):X=X-2*(X<=1):X =X+2*(X>=255):Y=Y-2*(Y<=1):Y=Y+2 *(Y>=190):PSET(X,Y):NEXTI,J

> Paul Wagorn Carp, Ontario

(For this winning one-liner contest entry, the author has been sent copies of both *The Rainbow Book Of Simulations* and its companion *Rainbow Simulations Tape.*)



rgs Micro Electronics

USA

RGS MICRO INC. MAIN ST. DERBY LINE, VERMONT ZIP 05830

TEL: 802-873-3386 ORDER LINE:

800-824-4454

TERMS: UISA, MC SHIPPING: BATES?

CANADA

RGS MICRO INC. 759 VICTORIA SQUARE, #303 MONTREAL H2Y 2J3 TEL: (514) 287-1563 ORDER LINE ONLY, FOR QUEBEC, ONTARIO, MARITIMES

800-361-5338

WESTERN CANADA: 800-361-5155

AUSTRALIA DISTRIBUTOR

BLAXLAND COMPUTER

768 MURPHY STREET BLAXLAND 2774 PO BOX 125 BLAXLAND NEW SOUTH WALES **AUSTRALIA**

TEL:((047)) 30-3003

HOURS: MONDAY-FRIDAY 10-6 SATURDAY 10-4

new III K-dos

THE FIRST
FULY RS-DOS
COMPATIBLE

INTEGRATED SCREEN EDIT
CURSOR CONTROL.
UNDO - FOR SCREEN EDIT
COLD START
RAMI-MOVE ROM TO RAM SHIFT CLEAR MENU ALLOWS
TWO KEY ENTRY TO 128 K-CARD,
SECS 80 AND HARD AND FLOPPYDISKS DRIVES WIRE MULTIPACK
TAPE TO DISK
SCREEN TO PRINTER DUMP
USER DEFINABLE COMANDS
SUPPORTS AUTOBOOT

on sk e-prom

3 69.95

WITH OUR 80 COLUMN CARD no boots required...

Just turn on to our

SECS 30 1



SCREEN Edit Control System 80 Colomn-Card

SECS 80 FEATURES.

- FULL SCREEN EDIT CURSER CONTROL.
- 2K STAND ALONE SYSTEM OR 8K K-DOS INTEGRATED VERSION, REQUIRING NO INTERNAL MEMORY.
- •FULL UPPER AND LOWER CASE.
 ATTRIBUTES INCLUD: BLINKING, UNDERLINE,
 INVERSE VIDEO, SELECTABLE CURSOR STYLE,
 THINE & WIDE GRAPHICS AND SMOOTH SCROLL
 OR OPTIONAL 25TH NON- SCROLLING LINE.

2K VERSION:

\$ 99.95

8K VERSION

\$ 129.95

HARD DISK DRIVES

5,10, or 20 meg

JUST PLUG IN I

STARTING FROM \$ 699.00 !

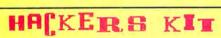
Our complete operating system FEATURES

- * Fully integrated into disk basic
- Tape to hard disk
- * Disk to hard-disk
- * hard-disk to tape
- * Hard-disk to disk
- * Duplicate
- Cold start
- * m-run
- ALL EXTENDED DISK BASIC COMMANDS ARE SUPPORTED
- * SUPPORTS K-DOS, 128
 K-RAM CARD & SECS-80
 CARD.

05-9 utility paox

BOOT STRAPS, FORMATTER

0 129.00



\$ 399.99

HARD DISK CONTROLLER, INTERFACE CARD, CABLE & OPERATING SYSTEM WITH MANUAL.

Super Sale I On New DISKDRIVES STARTING FROM

\$149.00

tandon, teac. Panasonic

SEBIAL PARALLEL PRINTER INTERFACE - \$ 39.95
DUAL DOS SWITCHER FOR J&N CONTROLLER - \$ 19.95

WRITE FOR

In this example, we have a number of private and public variables, procedures and functions. The variables 'R', 'I' and 'C' are all private variables in that they are known only within the module KeyboardData. The variable ThisDate, on the other hand, is a public variable because the VAR statement which declares it has a PUBLIC attribute following it. This means that ThisDate can be accessed by other modules while 'R', 'I' and 'C' cannot.

By the same token, the procedure DisplayError is a private procedure while the functions GetPercent and GetYesNo, as well as the procedure GetDate, are all publicly known. These last three all have the PUBLIC attribute following the FUNCTION or PROCEDURE statement.

Reasons for Choosing PUBLIC

The above declarations have been made for a particular purpose. In this case, the variables 'R', 'I' and 'C' are local work variables for use by all the routines in KeyboardData. There is no reason to allow other modules to access

these variables and, by keeping them private, we can ensure that other modules do not inadvertently modify them.

This Date, on the other hand, is public because it contains the result of the procedure GetDate. Routines in other modules would invoke GetDate in order to prompt for and validate a date. On return, the resulting date can be accessed from This Date.

The routines GetPercent, GetYesNo and GetDate are all publicly known because they represent the purpose of the module to prompt for and validate various types of data from the keyboard. Therefore, these routines will be directly invoked from other modules in order to perform a particular function. The procedure DisplayError has not been publicly declared because it is merely a local utility routine for use exclusively within the module.

The EXTERNAL Part

The next thing to do is access this module from your main program. For example:

```
PROGRAM MyProgram (Input, Output);
 TYPE Date = RECORD
                Month, Day, Year : Integer;
              END;
  VAR EXTERNAL
      ThisDate : Date;
  VAR ... (* local variables *)
  FUNCTION GetPercent (Prompt : String) : Real;
  EXTERNAL;
  FUNCTION GetYesNo (Prompt : String) : Boolean;
  EXTERNAL;
  PROCEDURE GetDate (Prompt : String);
  EXTERNAL;
  ... (* local procedures and functions *)
BEGIN
  IF GetPercent ('STARTING PERCENT') > .5 THEN BEGIN
   · GetDate ('STARTING DATE');
    IF ThisDate.Year > 1960 THEN ...
END.
```

In this program, we had to declare the type Date in order to properly declare the external variable ThisDate. Like the PUBLIC attribute, external variables are declared in a VAR statement that contains the keyword EXTERNAL immediately after the keyword VAR.

The routines GetPercent, GetYesNo and GetDate are declared EXTERNAL. Notice that after the declarations of these routines, there is only the word EXTERNAL; there is no body to these routines.

Down in the executable portion of the program, the external variable and routines are used exactly as though they were local to this module.

"...all the variables, procedures and functions declared with an interface block are automatically declared as external."

Linking the Modules Together

All of these external identifiers represent things which are not present in the program module MyProgram, but which are present in other modules which will be linked together with MyProgram by DEFT Linker. Because they are not locally present, the compiler cannot completely generate the required instructions when any of them are referenced by executable statements.

What the compiler does is generate a note to the linker that this module is referencing an item that is present in some other module. Later, when the linker reads in all the modules that are to be linked together, it can determine what PUBLIC identifiers are present and what their addresses are. Then, when the linker encounters one of these notes from the compiler, it can determine what the proper address should be and inserts it at that point in the code to complete the instruction.

INTERFACE Blocks

As you can see, there are a number of lines of code the main program must have in order to allow it to access the module KeyboardData. These lines essentially declare the public *interface* to the module KeyboardData. *DEFT Pascal* contains a second mechanism called an INTERFACE block for specifying the interface to a module. For example, using the INTERFACE block in *MyProgram* would look like this:

```
INTERFACE KeyboardData;
 TYPE Date = RECORD
                Month, Day, Year : Integer;
  VAR ThisDate : Date;
 FUNCTION GetPercent (Prompt : String) : Real;
  FUNCTION GetYesNo (Prompt : String) : Boolean;
 PROCEDURE GetDate (Prompt : String);
END;
PROGRAM MyProgram (Input, Output);
  VAR ... (* local variables *)
  ... (* local procedures and functions *)
BEGIN
  IF GetPercent ('STARTING PERCENT') > .5 THEN BEGIN
    GetDate ('STARTING DATE');
    IF ThisDate. Year > 1960 THEN ...
END.
```

Using this method, there is no declaration of any of public identifiers (or the required TYPE definition) from the module KeyboardData in the program MyProgram. Instead, the entire interface appears to be predefined. Notice in the INTERFACE block that there is no use of the keyword EXTERNAL, nor do any of the procedures or functions have bodies. That is because all the variables, procedures and functions declared with an interface

block are automatically declared as external.

An INTERFACE block is usually put in a separate source file from any other source file that might need it. A %C compiler directive is then used to include the declarations at the beginning of the file. The standard PASCAL library is declared in exactly this way by always doing an implicit %C on the file PASCALIB/EXT at the beginning of any PASCAL program.

Example Program

This month's example program actually consists of two separate listings. The first is an expanded version of our Keyboard Data module. It contains the three public routines and variables that we have been using as an example.

The second is a listing of the program *Interest* which computes the total value of an investment. You supply beginning and ending dates, the interest rate, whether it is compounded quarterly (as opposed to yearly) and the initial investment amount. *Interest* uses the routines in KeyboardData in order to prompt for and validate the information that is entered. It also contains a local subroutine, CountDays, that gives an absolute day number to a given date.

You will notice that we used an INTERFACE block to link *Interest* to KeyboardData. The main program then not only used the variable, function and procedure identifiers, but also the type Date which was declared in the interface.

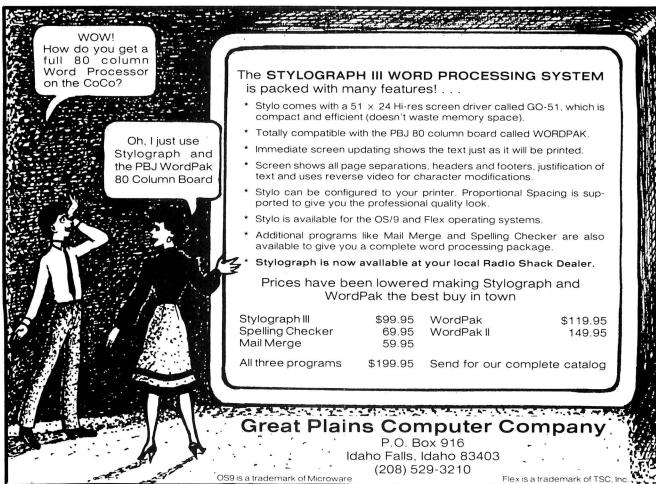
If you have any questions about the separate compilation facilities in *DEFT Pascal*, you can call (301)253-1300 during normal business hours for help. Next month, we will learn about linking *DEFT Pascal* with 6809 assembly language.

If you have a disk system, these commands are needed prior to loading the program:

PCLEAR 1 FILES 0,0 CLEAR 16,4999

```
00 0052
Listing 1
                                                                                  00 0052
00 0052
                                                                                                This Routine Prompts for percent values
                                                                                  00 0052
         (***************
00 0000
                                                                                  00 0052
                                                                                            **************
00 0000
              This module contains a set of routines that
00 0000
                                                                                  00 0052
                                                                                           FUNCTION GetPercent (Prompt : String) : Real;
              provide the ability to input and validate various types of data from the keyboard
00 0000
                                                                                  10 0052
00 0000
                                                                                  10 0052
                                                                                           BEGIN
00 0000
                                                                                  11 0056
                                                                                             NeedMessage := False;
         *************
00 0000
                                                                                  11 005C
11 005C
                                                                                             REPEAT
00 0000
                                                                                               DisplayError:
         MODULE KeyboardData;
                                                                                  11 0064
11 0087
                                                                                             WRITE (Prompt, '(%)');
READLN (R);
UNTIL (R >= 0.0) AND (R <= 100.0);
00 0000
00 0000
         TYPE Date = RECORD
                                                                                  11 009A
00 0000
                       Month, Day, Year : Integer;
                                                                                  11 00DA
                                                                                             GetPercent := R / 100.0;
                     END;
                                                                                  11 00F9
00 0000
         VAR R : Real:
                                                                                  00 00FD
00 0006
00 0007
              C : Char;
                                                                                            (*****************
             Needliessage : Boolean;
                                                                                  00 00FD
00 0008
                                                                                                 This Routine Prompts for Yes/No values
00 0008
         VAR PUBLIC
                                                                                  00 00FD
00 0008
             ThisDate : Date:
                                                                                            *****************
00 000E
                                                                                  00 00FD
         (***************
00 000E
                                                                                  00 00FD
                                                                                            FUNCTION GetYesNo (Prompt : String) : Boolean;
00 000E
                                                                                  10 00FD
                                                                                            PUBLIC:
00 000E
              This Routine displays an error message
                                                                                  10 00FD
                                                                                            BEGIN
                                                                                     0101
                                                                                  11
                                                                                              NeedMessage := False;
         ***************
00 000E
                                                                                  11 0107
                                                                                             REPEAT
                                                                                    0107
                                                                                               DisplayError;
00 000E
                                                                                             WRITE (Prompt, '(Y/N)');
READLN (C);
UNTIL (C = 'Y') OR (C = 'N');
00 000E
                                                                                  11 0110
         PROCEDURE DisplayError;
                                                                                     0135
10 000E
          BEGIN
           IF NeedMessage THEN WRITELN ('*** ERROR - OUT OF RANGE');
NeedMessage := True;
11 0012
                                                                                  11 0148
                                                                                              GetYesNo := (C = 'Y');
11 004E
         END:
                                                                                  11 018E
                                                                                           END:
```

```
Listing 2
                                                                                                      00 0000
                                                                                                                          investment at the end of a given period of
                                                                                                      00 0000
                                                                                                                          time.
                   ***********
                                                                                                      00 0000
 00 0192
                                                                                                                    ***************
 00 0192
                     This Routine Prompts for date values
                                                                                                       00 0000
 00 0192
                                                                                                       00 0000
                                                                                                                    PROGRAM Interest (Input, Output);
 00 0192
              **************
                                                                                                      00 0000
 00 0192
                                                                                                                    VAR FirstDate : Date:
 00 0192
              PROCEDURE GetDate (Prompt : String);
                                                                                                       00 0000
 10 0192
                                                                                                       00 0000
                                                                                                                         Years
                                                                                                                                      : Real;
 10 0192
                                                                                                       00 0000
                 NeedMessage : False;
 11 0196
                                                                                                                         Periods
                                                                                                                                      : Real;
 11 019C
                 WITH ThisDate DO
                                                                                                       00 0000
 11 019C
11 019C
                   REPEAT
                                                                                                       00 0000
                                                                                                                    FUNCTION CountDays (D : Date) : Real;
                      DisplayError;
                                                                                                       10 0003
                   DisplayError;
WRITE (Prompt, '(MI,DD,YYYY)');
READLN (Input, Honth, Day, Year);
UNTIL (Month >= 1) AND (Honth <= 12) AND (Year > 0) AND
(Day >= 1) AND ((Day <= 28) OR
((Day <= 31) AND (Month IN [1,3,5,7,8,10,12])) OR
((Day <= 30) AND (Honth IN [4,6,9,11])) OR
((Day <= 29) AND (Month == 2) AND (Year MOD 4 == 0)));
 11 01A5
                                                                                                       10 0003
                                                                                                                    VAR Days : ARRAY[1..11] OF Integer;
 11 01D1
                                                                                                                                : Integer;
                                                                                                       10 0003
    0205
                                                                                                       10 0003
                                                                                                                         Total: Real;
 11 0248
                                                                                                       10 0003
    0276
                                                                                                       10 0003
                                                                                                                      Days[1] := 31; Days[2] := 28; Days[3] := 31; Days[4] := 30; Days[5] := 31; Days[6] := 30; Days[7] := 31; Days[8] := 31; Days[9] := 30; Days[10]:= 31; Days[11]:= 30;
11 02DA
11 0326
                                                                                                       11 000A
                                                                                                          0072
 11 0387
              END:
                                                                                                       11 00DA
                                                                                                       11 0128
                                                                                                                      WITH D DO BEGIN
Year: "Year - 1;
I: "Year DIV 4 - Year DIV 100 + Year DIV 400;
Total: "Day + I + Year * 365.0;
IF (Year+1) MOD 4 = 0 THEN Days[2]: "29;
FOR I: "1 TO Month-1 DO Total: "Total + Days[1];
                                                                                                       11 0128
12 0128
              (***************
00 0000
00 0000
                                                                                                       12 0139
12 0172
00 0000
                    This is the interface module for KEYBOARDDATA which contains a set of routines that
00 0000
                                                                                                       12 01A4
                    provide the ability to input and validate various types of data from the keyboard
00 0000
                                                                                                       12 01E0
 00 0000
                                                                                                       12 0233
                                                                                                                         END:
 00 0000
                                                                                                       11 0233
                                                                                                                       CountDays := Total;
 00 0000
              *************
                                                                                                       11 0242
                                                                                                                    END:
00 0000
00 0000
              INTERFACE KeyboardData;
00 0000
00 0000
             TYPE Date - RECORD
                                                                                                       00 0246
                                                                                                                    BEGIN
00 0000
                                                                                                       01 024D
                                Month, Day, Year : Integer;
                                                                                                                       Page;
00 0000
                              END;
                                                                                                                       WRITELM ('EARNED INTEREST CALCULATION');
                                                                                                       01 0259
                                                                                                                      WRITELN;
GetDate ('START');
00 0000
                                                                                                          0286
             VAR ThisDate : Date:
                                                                                                       01 028E
                                                                                                                      GetDate ('START');
FirstDate: = ThisDate;
GetDate ('END');
Years:= (CountDays (ThisDate) - CountDays (FirstDate)) / 365.2425;
Rate:= GetPercent ('YEARLY RATE');
Periods:= 1.0;
IF GetYesNo ('QUARTERLY?') THEN Periods:= 4.0;
00 0000
                                                                                                       01 0246
             FUNCTION GetPercent (Prompt : String) : Real;
FUNCTION GetYesNo (Prompt : String) : BOOLEAN;
                                                                                                       01 0288
00 0000
                                                                                                          02CE
00 0000
              PROCEDURE GetDate (Prompt : String);
                                                                                                       01
                                                                                                          0317
00 0000
                                                                                                          0340
                                                                                                       01 0353
                                                                                                                       WRITE ('AMOUNT: ');
                                                                                                          038C
             (***************
00 0000
                                                                                                       01
                                                                                                          0345
                                                                                                                       READLN (Amount):
00 0000
                                                                                                          0385
                                                                                                                       WRITE ('FINAL VALUE:', Amount * EXP (LN (1.0 + Rate / Periods)
00 0000
                    This is an earned interest program
                                                                                                       01
                                                                                                          0400
                                                                                                                                                                        * Periods * Years):12:2);
                    which computes the total value of an
00 0000
                                                                                                       01 0436
```



OS-9 SOFTWARE WITH X-TRA POWER

XTERM

XTERM is a full featured OS-9 communications program that takes full advantage of the power of OS-9. It works with the normal text screen, XSCREEN, or the Wordpak 80 column board

XTERM is menu oriented for ease of use, it is simple to use even for the novice OS-9 user. And yet, XTERM is powerful enough for the expert OS-9 user.

Some of the features of XTERM include: full upload and download support with remote buffer operation; supports XON/XOFF protocol; 110/300/600/1200 baud, 5/6/7/8 bits, even/odd/no parity, full or half duplex; able to execute an OS-9 shell command from within XTERM.

XTERM works with a Color Computer using the standard serial interface, but also will work with a hardware serial port. Also, if you are using a hardware parallel printer port, you can print data to the printer as it is received.

XTERM \$59.95

XMENU

XMENU is a system that creates a menudriven environment for the Color Computer using OS-9. OS-9 now becomes easy-to-use with command selections made from menus. Menus are included to access OS-9 commands. An easy-to-use utility is provided that allows for the creation and maintenance of menus.

XMENU works with XSCREEN, the normal text screen, O-PAK, and the WORDPAK 80-column board.

XMENU \$39.95

XWORD

XWORD is a powerful word processing system for the Color Computer using OS-9. XWORD is feature packed with only a few features mentioned here.

Some of the editing features of XWORD include: true character oriented full screen editor; works with the normal text screen, XSCREEN, O-PAK, or WORDPAK 80 column card; full block commands with blocks displayed in inverse characters (except with normal text screen) for easy block manipulation; file size not limited to a buffer size; full find and replace commands with wildcard character; able to execute an OS-9 shell command in the middle of editing. Many, many more features, too many to mention here.

Some of the formatting features of XWORD include: proportional spacing supported; perfectly aligned hanging indents and columns, even when using proportional characters; full printer control with control of character size, emphasized, italics, overstrike, underlining (with or without spaces), super and sub-scripts; up to 10 header/footers; page numbering in decimal or Roman numerals; margins and headers can be set differently for even and odd pages; automatically reads printer initialization file to define XWORD for your printer (many included, and easy to write or modify your own). Many more features.

XWORD \$79.95

XSCREEN

XSCREEN creates a high resolution screen for the Color Computer using OS-9. This high resolution screen gives you 24 lines of text with 51, 64, or 85 characters per line. Characters can be either white on a black background or vice versa. Easy menu operation.

XSCREEN \$19.95



MICROTECH = CONSULTANTS

NEW

INC 1906 Jerrold Avenue St. Paul, MN 55112

Dealer Inquiries Invited

OS-9 is a trademark of Microware Systems Corp.



Ordering Information

Add \$2.50 shipping & handling. MN residents add 6% sales tax. Visa, Mastercard, COD (add \$2.50), personal checks: all shipped from stock within 24 hours.

(612) 633-6161

RAINBOWTECH

KISSable OS-9

An Overview Of Programs, Corrections And More

By Dale L. Puckett Rainbow Contributing Editor

Back in the old year, we were looking forward to 1985. Yet, the beginning of a new year, like many of life's milestones, often brings us reminders of our human frailties—not to mention much unfinished business.

This year, the reminder about some of the unfinished business came a week or two ago from Dr. Bud Pass, a well-known programmer, writer and owner of Computer Systems Consultants, Inc. in Conyers, Ga. He had sent us the latest version of his *CMODEM* for Color Computer OS-9. He enclosed a short note with the disk to express his concern that we had never mentioned any of his products in "KISSable OS-9."

Dr. Pass sent me a lot of information and copies of his programs earlier in

(Dale L. Puckett is a free-lance writer and programmer who has worked with the Motorola family of microprocessors since 1976. He is the author of The Official BASIC09 Tour Guide, published by Microware and has just completed The Official Rainbow Guide to OS-9. He serves on the InfoWorld Software Review Board and is a chief warrant officer in the U.S. Coast Guard.)

the year. We had intended to pass along an overview of his products for months, but, as with most good intentions, rapidly approaching deadlines, weeks of temporary additional duty and other problems got in the way, and we never had the chance to prepare that overview.

We'll do that first this month. We'll also try to give you a quick overview of a few of the products available from JBM in King of Prussia, Penn.

". . .to help encourage you to jump in and get your feet wet with BASIC09, we'll present two more short procedures written by a beginner."

We also have some more feedback on Radio Shack OS-9 Version 1.01.00 and more good news about the OS-9 Users Group Software Library. And finally, to help encourage you to jump in and get your feet wet with BASIC09, we'll present two more short procedures written by a beginner.

CMODEM for CoCo OS-9

CMODEM is a communications program for Color Computer OS-9 that lets you receive or transmit files from or to another computer. It lets you use the Ward Christiensen XMODEM file transfer protocol found on CompuServe, Telenet, Newsnet and many CP/M bulletin board systems. The XMODEM protocol places no restrictions on the contents of the files you transmit. Because of this, you can receive pure ASCII text files, binary program files or command files that contain special control characters.

When used in the XMODEM mode, CMODEM receives or sends your data in blocks. A special checksum verification routine lets the receiving computer know that it received all the data in a block accurately. If there was static on the telephone line and a block is not transmitted accurately, CMODEM tells the other computer that it did not receive the block properly and asks it to send the block again. This process is repeated until the block is received accurately.

CMODEM works well at 1200 Baud

THE OS:9 SOLUTION

by Jeff Francis

A COCO BREAKTHROUGH

FINALLY! THE PROGRAM THAT WILL MAKE OS-9 YOUR FAVORITE CoCo OPERATING SYSTEM! OS-9 SOLUTION IS A PROGRAM DESIGNED TO CREATE A "USER FRIENDLY" ENVIRONMENT WITHIN OS-9. YOU WILL FORGET THAT YOU ARE USING ONE OF THE MOST SOPHISTICATED AND ADVANCED OPERATING SYSTEMS EVER WRITTEN. THIS PROGRAM MAKES OS-9 EASY FOR EVERYONE FROM NOVICES TO EXPERTS! COMPLETELY MENU DRIVEN WITH PROMPTS AT ALL TIMES. BUILT IN "HELP SCREENS" FOR RUN-TIME HELP. YOU MAY NEVER SEE THE OS-9 COMMAND PROMPT AGAIN!

INTRODUCTORY PRICE

64K DISK \$39.95

LOOK AT ALL THE FEATURES

- REPLACES 17 OF THE OLD "USER HOSTILE" COMMANDS WITH SINGLE KEYSTROKE, MENU DRIVEN, EASY TO USE COMMANDS.
- Saves a LOT OF TIME AND DISK SPACE - UP TO 20K IN YOUR CMDS DIRECTORY!
- No more typing in complex, Long pathnames!
- No more headaches with re-MEMBERING COMPLICATED SYNTAXES EVERYTHING IS PROMPT DRIVEN!
- DOES MULTIPLE COPYING, KILLING AND INFO PRINTOUTS FOR WHOLE OR PARTIAL DIRECTORIES.
- SET ALL XMODE PARAMETERS AT THE TOUCH OF KEYS.
- USES SEPARATE SOURCE AND DESTINATION DIRECTORIES FOR "SINGLE KEY" COPIES.
- ORGANIZING DIRECTORIES IS MADE EXTREMELY SIMPLE!
- ◆ ALL FILES ARE CONTAINED IN A DIRECTORY "WINDOW". USE THE AND ★ KEYS FOR ACCESS AND COMMAND EXECUTION.

COMMAND SUMMARY

- A ALPHABETIZE FILENAMES
- B BACKUP DISK
- C COPY FILE
- D DELETE FILE OR DIRECTORY
- E EXAMINE FILE
- F FORMAT DISK
- G GOTO PARENT DIRECTORY
- H HELP SCREEN
- I INFORMATION ON A FILE
- J JUMBLE AROUND FILENAMES
- K KOMPARE FILES
- L LOAD IN A FILE
- M MAKE DIRECTORY
- N NEW DIRECTORY (READ IT)
- 0 OUTPUT FILE
- P Put together files
- Q QUIT OS9 SOLUTION
- R RENAME FILENAME
- S SET DESTINATION DIRECTORY
- T SET FILE ATTRIBUTES
- U USE ANOTHER DISK
- V VERIFY FILE
- W WORK MULTIPLE FILES
- X XMODE PARAMETERS
- Y DISPLAY FREE SECTORS
- Z EXECUTE SHELL COMMAND

ALL ORDERS PLUS \$3.00 S/H - NY RESIDENTS ADD SALES TAX

SPECTRUM PROJECTS

WEST DIVISION PO BOX 9866 SAN JOSE, CA 95157-0866 EAST DIVISION PO BOX 21272 WOODHAVEN, NY 11421

ORDER HOT LINES - 408-243-4558 & 718-441-2807

on the Color Computer and faster on systems that use an ACIA instead of the bit banger RS-232 port on the rear panel of the CoCo. The standard OS-9 version uses the standard OS-9 path descriptor named /TI, and is compatible with both OS-9 Level I and Level II systems. The Color Computer version contains its own drivers and uses the PIA printer/modem port. CMODEM is written in Dyna C and you can purchase the source code. This makes it a very educational as well as useful package.

The program is menu-driven and very easy to use. In fact, you can even run it without looking at the manual. *CMODEM*'s prompts give you all the information you need. You simply pick a letter — or sometimes a number in the submenus. Once you know the program, you can run *CMODEM* in the expert mode which shortens the prompts.

You can modify most of the program's parameters from the menu.

Here are your choices from the main menu:

- T: Terminal mode
- ?: Toggle Expert mode
- G: Gather text in memory buffer
- V: View text in memory buffer
- A: Dump an ASCII file
- K: Kill text in memory buffer
- E: Toggle Echo mode
- M: Modify program parameters
- B: Set Baud rate
- D: Set delay factor
- S: Send a file using XMODEM protocol
- R: Receive a file using XMODEM protocol
- X: Transfer a binary file using XMODEM protocol
- Y: Receive a binary file using

XMODEM protocol

- Q: Quit
- O: Gives you OS-9 prompt (to run a DIR for example) (CLEAR BREAK returns you to CMODEM)
- H: Hang up phone
- F: Flush data collection buffer to file
- C: Close text collection file
- L: Generate linefeed locally following carriage return

You can return to the selection menu above at any time by holding down the CLEAR key and typing the '@' character.

"OS-9 communications programs that can deal with the bit banging PIA port on the Color Computer have been a long time coming . . . This latest version of CMODEM seems to have conquered all the problems."

Make sure you wire your cable correctly if you plan to use *CMODEM* with the Color Computer. *CMODEM* requires the non-standard wiring below:

pins 1 and 2 received data pin 3 ground pin 4 transmitted data

When you connect pin 1 and pin 2 together, you generate an interrupt each time you send a character to the port. CMODEM's drivers need this interrupt

to function properly.

OS-9 Communications programs that can deal with the bit banging PIA port on the Color Computer have been a long time coming. Every programmer who has tried has run into problems. This latest version of *CMODEM* seems to have conquered all the problems. It worked well and it was fun to use.

Other products written by Dr. Pass include Super Sleuth, a disassembler that runs on OS-9, FLEX and UNI-FLEX; cross assemblers that run under OS-9 and generate code for the 6800, 6801, 6805, 6502, 8080, 8048, 8045 and Z-80 microprocessors; a program that helps translate 6502 assembler code into 6809 code; and a program that translates position dependent 6800 or 6809 code into position independent code. Many of these programs, especially Super Sleuth, have been around for several years and are widely acclaimed.

Now, about JBM

John B. Martin and his programmers have been active in the OS-9 community for several years. After they ran a lot of advertisements for their OS-9 products for the Color Computer early this year, my curiosity got the best of me and I gave them a call. I wound up with so many programs that I was overwhelmed.

In our continuing attempt to clean the slate and start the new year fresh, here's an overview of the JBM Group's OS-9 product line.

LOOKUP and SLOOKUP are JBM's answer to the missing metacharacters and wild cards in the OS-9 shell. On MS-DOS and CP/M computers you can type ''DIR *.BAS'' to see a listing of only those programs that have a "BAS" extension. You can do the same thing with many of the UNIX utilities. You can't do it with OS-9's DIR command.

* LOCAL* IN * LOS *ANGELES * LOCAL* IN * LOS *ANGELES * LOCAL* IN * LOS *ANGELES

* SOFTWARE *

Green Mountain Micro!!
Computerware (All)
Custom Software (No Disc.)
Frank Hogg Labs (OS-9 & Flex)
Key Color Software (Key 264K)
Tom Mix (All)
Moreton Bay (More)
Prickly Pear (Colorkit!)
Spectral Associates
Softlaw (VIP & Colorquest)
Speech Systems (All)
Sugar Software & (Super)



* E.D.C. INDUSTRIES *

Software • Hardware • Support Educational • Small Business • Games

VOICE (213) 254-6809 10 A.M.-10 P.M. BBS (213) 258-0640 24 HRS. 300 and 1200 Band

Extended Hours+Call before coming.

6130 YORK BOULEVARD

Near North Figueroa St.

POST OFFICE BOX 42718 LOS ANGELES, CA. 90050

EXCLUSIVELY E.D.C.

232 RemotePlus by David Cherin

- ✓ Requires RS232 or Similar & 64K
- ✓ Remote Terminal Program
- ∠ No Lost or Garbled Data
- ∠ Error Trapping ∠ Software Clock
- ✓ Disable Break Key ✓ Inkey\$ Support

OS * ANGELE

- ✓ New Terminal Program
- ∠ Conversation Mode
- All Ext. & Disk Commands
- ∠ 20 Commands Added
- ✓ Perfect for BBS
- ✓ 4 Versions Included: Ext., 1.0,1.1 & JDOS
- ∠ Much More Uses 4K

\$24.95 + 2.50 S & H (CA. res. + tax)

LOCAL* IN * LOS * ANGELES * LOCAL* IN * LOS * ANGELES * LOCAL* IN * LOS * ANGELES

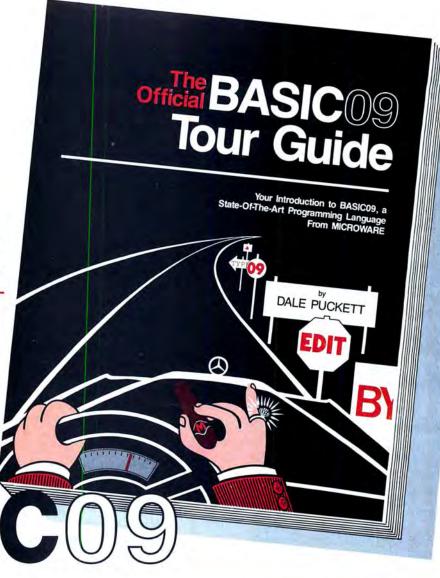
GE

Computer Systems Center

Valley Micro Systems (BBS)

CoCoPro (V2)

Get the most out of BASIC



The OFFICIAL BASIC09 TOUR GUIDE is skillfully written in a friendly and easy-to-read style. Just perfect for those new to computers and to BASIC09. It's also a valuable reference book for programmers, engineers, students and hobbyists, providing an in-depth look at BASIC09 plus an overview of the OS-9 operating system. Comprehensive reference sections on BASIC09 and OS-9 commands are also included.

The book "maps" out your route through the Mercedes of Basics . . . BASIC09 and puts you in the driver's seat in no time. Fasten your seatbelt, sit back and enjoy the ride to perfecting your programming skills.

MICROWARE . . .

The OFFICIAL BASIC09 TOUR GUIDE comes from the people who wrote BASIC09. As the leader in 6809 system software, we at MICROWARE care about our users and want to help you get the most from our products.

It's Easy to Order.

Phone orders are accepted from MasterCard or VISA cardholders or for COD shipment. You can also order by mail using the coupon below. Quantity discounts are available to educational organizations and dealers. For further information contact Microware.

Microware Systems Corporation 1866 N.W. 114th Street Des Moines, Iowa 50322 Telephone 515/224-1929 Telex 910-520-2535

Please send ______ copies of the Basic09 Tour Guide book at \$18.95 each. Add \$2.00 for UPS shipping in the U.S. or \$5.00 for overseas air mail per book. Iowa residents add 4% sales tax.

Name _____

Address _____

_

☐ I have enclosed a check☐ Charge to my bank card:

MasterCard VISA Card Number Expiration

Zip

microware -

Specialists in system software for 68-family microprocessors since 1977.

OS-9 and BASIC09 are trademarks of Microware and Motorola.

To solve the problem, JBM wrote LOOKUP and SLOOKUP in BASIC09. When you buy the program you receive I-code that runs under RUNB. The wild card character, an asterisk, can appear anywhere. LOOKUP also lets you search subdirectories for missing files.

SLOOKUP is identical to LOOKUP, except its output appears in sorted form. This makes it a very handy tool for organizing your disks. Also, since LOOKUP sends its output to OS-9's standard output path, you can easily redirect it to your printer for a hard copy or to a file for future reference.

"When you purchase the new version of OS-9, you must again install any custom drivers you had added to your original version of OS-9. Follow the directions from the software manufacturer that you followed when you installed them the first time."

And finally, the LOOKUP/SLOOKUP package also includes a wild card delete procedure. This procedure prints the name of any file that matches your request and then deletes it.

JBM's EXAMOD/CHGREV utilities are two more BASIC09 I-code modules that you install in your working execution directory — usually /D0/CMDS.

You use *EXAMOD* to examine a disk file and determine what type of modules it contains. It reports the module's language, type, size, data storage requirements, revision number, edition and the offset from the beginning of the module to its execution address. Like the LOOKUP package above, *EXAMOD*'s output can be redirected to any device or file on your computer.

CHGREV gives you a shorthand method of changing the version number of BASIC09 I-code or 6809 object code modules in a file. It automatically updates the header parity and CRC of the module after it makes the change for you.

The LdMac package from JBM is a group of 6809 object code modules that can be called from BASIC09 to perform a number of tasks that are often required in business programs. Some

of these tasks can already be performed from BASIC09 by running the SHELL command. Others could be written directly in BASIC09. However, both of these methods add overhead; either in the form of additional jobs running concurrently on your computer or in extra memory and slower speed.

If you plan to use the routines a lot you can even load them into memory with a command in your *STARTUP* file. They total less than 4K bytes of memory. To save space, we'll define the individual routines that come with *LdMac* in table form.

Routine	Function
BFill	Fill a string with spaces
Caps	Capitalize all lowercase
	letters in a string
CFill	Fill a string with the character you specify
	character you specify
Cmpar	Compare corresponding
	fields in similar structures
ComCRC	Compute the cyclic re-
	dundancy value of a
F213.4	module
FilMgr	Return files' size or po-
C 4 44	sition in file
GAtt	Return the attributes of a file
GetID	77 7777
GettD	Return a process number and its User's Number
GMod	Return names of modules
GWIOG	linked to BASIC09 module
GPri	Report the priority of a
0	process
HiC	Convert OS-9 strings to
	BASIC09 strings
InByts	Accept unformatted data
	from a terminal
Lop	Remove leading spaces
	from a string
Psit	Position a source string
G HIID	in a target string
SetUID	Change a program's user
Classa	identification number
Sleeper	Suspend a BASIC09 process temporarily
SPri	Set the priority of a
3111	process
Squeez	Remove all spaces from
Squeez	a string
Tetrl	Set characteristics of a
Tetti	terminal
Tnmbr	
1 1111101	Report the name of a user's terminal
	user's terminal

The ADLIB package gives you a way to copy data structures, comments and subroutines from a library file to a source code file. This makes it easier to use the same routines over and over, and eliminates the time wasted when

you continue to recode the same routines each time you need them.

ISAM is a package of BASIC09 programs that let you create and use Indexed Sequential Files. It contains three programs and one procedure to let you create, update, review or reorganize your files.

Another JBM package named XRF will let you use ISAM files that require more than one key. For example, when you are searching through a file containing a list of your employees, you may want to locate an employee's record by name, by payroll number or even by the date he came to work for you. The XRF package helps you create the multi-key index you need to do this type of job.

And finally, JBM sells a string arithmetic system that lets you add, subtract, multiply, divide or compare very large numbers accurately. When we say large, we mean 18 digits. It is well-suited for financial applications where accuracy is a must.

In recent months JBM has released three new packages. We haven't seen them, but they look like they could prove useful in a typical office. They are *MESSAGE*, a multi-terminal mail system for OS-9 Level II systems; *CAL*, a personal appointment diary; and *GENUS*, a stand-alone sort program.

Comments about Version 1.01.00

The local Radio Shack in Springfield, Va., finally received their second shipment of Color Computer OS-9 Version 1.01.00 a few days before Christmas. By the time I received my copy, the comments were starting to arrive.

Hawkins of Ladysmith, Wis., reporting that the new version of OS-9 would not work with the *Disk Fix* utility package sold by Computerware. Since at one time or another I have used both Computerware's new *CCDISK* module and D. P. Johnson's *SDISK* package, I was concerned.

Yet, since I knew both packages simply contained replacement modules for the original Radio Shack CCDISK module, I couldn't imagine why they wouldn't work. But, rest easy friends. Both packages do work with the new Radio Shack Version 1.01.00. I tried them myself. Then, later I confirmed that other people were using both packages with the new version of OS-9. Bill Brady left a message in one of the databases on CompuServe's OS-9 SIG. Here is a summary of his notes.

"O-PAK works the same with the

new *CCIO*. The new version also works fine with *SDISK* and double-sided, double-density disks. It works fine with the PBJ *PC-PAK*, which contains a clock chip and parallel printer port," Brady said.

"The new t2 driver works, but I suggest you set your NULLs=4 to allow X-On and X-Off to work properly. HiTerm and other BASIC09 programs execute the same. I've noticed the typeahead loses far fewer characters now. That alone makes it for me." he said.

After receiving Hawkins' letter, I also spoke with Brian Lantz, a free-lance programmer in Tampa, Fla., who authored Computerware's new *DATA BANK* database manager program. He reported that he also has been using both *SDISK* and Computerware's *CCDISK* with Version 1.01.00. This makes me think that a reminder is necessary.

Remember! When you purchase the new version of OS-9, you must again install any custom drivers you had added to your original version of OS-9. Follow the directions from the software manufacturer that you followed when you installed them the first time.

I suspect Hawkins booted up OS-9 with his new Version 1.01.00 disk, and then tried to read a double-sided, 40-track disk he had initialized after installing Computerware's CCDISK into Version 1.00.00. Since the CCDISK module in the new version of OS-9 is basically the same as the CCDISK module in the old version, it still cannot read double-sided disks. Thus, Hawkins found a problem. Again! After you bring your new version of OS-9 to life, don't forget to reinstall any custom modules you have been using.

Along those lines, here's a trick you can use with D. P. Johnson's *SDISK*. If you only own single-sided disk drives and only use *SDISK* to read or write a standard OS-9 disk every once in awhile, you do not need to permanently install *SDISK* in your OS9Boot file — just load the two modules, *SDISK* and *SDI*, when you need them. Once they are loaded into memory, you can use them by naming the standard disk device by name. For example:

OS9: dir/SD1 or OS9: list/SD1/WORK/ a_standard_OS9_file

After you have used *SDISK* and *SDI*, be sure to UNLINK them in order

to free the memory they use. On the other hand, if you own double-sided drives, you will find it worth your while to go to the trouble of making a new system disk that contains *SDISK* and the related standard OS-9 device descriptors.

Possible Errors in Documentation Changes

While we are on the subject of Version 1.01.00, I should mention that a scan of the new pages 99-102 of the OS-9 Technical Information Manual that come with the new disk contain several probable errors. Here are the problems I noticed.

Under "SS.READY": Under the exit conditions, if the carry bit in the 6809's CC register is clear on exit from the routine, then the 6809 B-register should contain a zero. If, on the other hand, the carry bit is set, this indicates there has been an error — and if that error happens to be that the device is not ready, then that B-register should contain \$F6, or in mnemonics, E\$NOTRDY. It looks like several lines were dropped in editing.

Following "SS.POS": The description for SS.EOF — the test for an end of file condition has been deleted. Don't throw out the pages from your original manual. This description does appear there

Under "SS.Joy": On Entry, the 6809's B-register should contain \$13, not \$12

as printed. If you used \$12, you would be asking OS-9 for the SS.DSTAT call just above. That's how these things work. The B-register always contains the function code of the function you want to perform. I may not have caught everything. If I missed one let me know, and I'll try to pass it on in the next available column.

And, in case you are wondering about all the excitement created by the new ACIAPAC device driver and /T2 device written to work with the RS-232 cartridge, here's the scoop: "It allows true RS-232 usage on the Color Computer, using a 6551 ACIA instead of the PIA 'bit banger' required if you use the 'RS-232' port on the rear panel. The 'bit banger' requires each bit to be forced through the PIA by software, limiting you to 300 or 600 Baud reliably. The RS-232 hardware pack takes the load off the software, and handles the data as true serial I/O, allowing reliable speeds up to 19,200 Baud!"

If you have a pioneering spirit — and most OS-9 users do — here's another interesting tidbit from the OS-9 SIG. It seems Dennis Bathory Kitsz of RAINBOWfest infamy is designing a "very inexpensive, down-'n-dirty" 68000 computer. He wants to know what you want to see in hardware and software. His CompuServe user number is 70136,1257 if you want to leave him a note. By the way, the comments and demands on that "thread" are unreal!

```
Listing 1:
```

```
PROCEDURE dumpm
REM Program to dump a file to either screen or
REM to the printer.
REM In the screen mode, it will display the data
REM 8 across. In the printer mode, it will display
REM 16 across.
REM
REM Version 1.3
REM October 14, 1984.
REM
REM Written by: A. Hoogenraad
REM 4316 Ditzler
REM Kansas City, Missouri 64133
REM
REM
DIM done: BOOLEAN
DIM pathlist, file: STRING
DIM answer:STRING[1]
DIM asciiword(16), path, wordbyte: BYTE
DIM output, word(13), i, max, device, asciicount, hexdump, hexcount: INTEGER
done=FALSE
LOOP
PRINT CHR$(12)
INPUT
      "<1> Printer
                       <0> Screen ",output
PRINT
```

OS-9 Users Group Notes

It saddens me to report that Richard Dundon, the editor of *MOTD*, the OS-9 Users Group newsletter, passed away after suffering a stroke on December 8, 1984. Although I had only met Dick in person on one occasion, I talked to him on the phone several times and considered him a good friend. He did an excellent job for the Users Group in the short time that he served.

Fortunately, for the Users Group, Dick's close friend Tim Grovac has volunteered to take over the editor's job—at least until the new officers are elected. If you have news, a program or anything you would like to share with other OS-9 users, please mail it to Tim. Here's his address:

MOTD Publishing 25825 104th Ave. SE Suite 344 Kent, WA 98031

Also, Tim is looking for an author to take over his BASIC09 column in *MOTD* as he moves on to publish the whole thing. If you are interested, he asks that you send your credentials and a sample of some of your writing to the address above. Give him a hand. More than 750 OS-9 Users Group members receive *MOTD* bi-monthly.

More Software Exchange Disks Available

Dave Kaleita, Software Exchange committee chairman, reports that disk numbers zero through nine, numbers 11 through 14 and number 21 have been completed and are available for your order. Additionally, disk number zero — the one you received free when you joined — and disk number three, a number of word processing utilities, have been improved and carry version numbers of 0.01 and 3.01, respectively.

In the December issue, we gave you the contents of disks zero through 13. Here's the breakdown on disk numbers 14 through 25.

- 14 File maintenance utilities
- 15 Communications programs
- 16 Hardware customizations (drivers and descriptors for non-standard hardware)
- 17 BASIC09 programmers toolkit
- 18 System utilities
- 19 Languages/programming environments (including XLISP)

```
INPUT "Enter the pathlist: ", pathlist
SHELL "dir "+pathlist
PRINT
PRINT "Want another pathlist? ";
GET #0, answer
EXITIF answer="n" OR answer="N" THEN
PRINT
ENDEXIT
ENDLOOP
INPUT "Enter the filename: ",file
pathlist:=pathlist+"/"+file
PRINT CHR$(12)
BASE O
OPEN #path, pathlist: READ
FOR 1:=0 TO 12
GET #path, wordbyte
word(i):=wordbyte
IF output=1 THEN
max:=16
OPEN #device, "/p": WRITE
ELSE
max:=8
device:=0
ENDIF
PRINT #device, "Name: PRINT #device, "Size:
                                "; file
PRINT #device USING "h2>"; word(2); word(3)
PRINT #device, "Name offset:
PRINT #device USING "h2>"; word(4); word(5)
PRINT #device, "Start addr:
PRINT #device USING "h2>"; word(9), word(10)
PRINT #device, "Data size:
PRINT #device USING "h2>"; word(11); word(12)
SEEK #path,0
REM print heading
PRINT #device," "
PRINT #device,
IF output=1 THEN
PRINT #device, "ADDR 0 1 2 3 4 5 6 7 8 9 A B C D E F 0 2 4 6 8 A C E"
PRINT #device, "----
ELSE
                                      0 2 4 6"
PRINT "ADDR
                0 1 2 3 4 5 6 7
PRINT "
                8 9 A B C D E F
                                      9 B D F"
PRINT "----
ENDIF
REM main dump routine
hexcount:=0
 WHILE NOT(EOF(#path)) DO
GET #path, wordbyte
 asciiword(asciicount):=wordbyte
 hexdump:=hexdump+1
 asciicount:=asciicount+l
 IF EOF(#path) THEN
```

20 — Color Computer toolkit

21 — File maintenance disk number

22 — Programming utilities disk number three

23 — File processing utils disk number three

24 — General interest disk number two

25 — Word processing utils disk number three

The programs for these disks have already been selected and forwarded to other committee members who are assembling the master disks. They should be available by the second quarter.

In December, we gave you a detailed breakdown of the contents of disks zero through five. I just received an alphabetical list of all programs in the Users Group library and their disk assignments. I am organizing it by disk number now and hope to publish it in the April issue.

And, finally, Dr. James Petty, Dr. Robert E. Ringrose and Joseph J. Dubuc — all OS-9 users in the Oklahoma City area — are doing a fantastic

```
done=TRUE
ENDIF
PRINT #device USING "h2>"; wordbyte;
EXITIF hexdump=max THEN
PRINT #device,
FOR i:=0 TO max-1
IF asciiword(i)>127 THEN
asciiword(i):=asciiword(i)-128
ENDIF
IF asciiword(i)<127 AND asciiword(i)>31 THEN
PRINT #device USING "sl>"; CHR$(asciiword(i));
PRINT #device,".";
ENDIF
NEXT 1
PRINT #device," "
ENDEXIT
ENDWHILE
EXITIF done=TRUE THEN
PRINT #device,"
ENDEXIT
IF MOD(hexcount, 128)=0 THEN
PRINT #device,"
```

STOCK & FUND INVESTING with the TRS-80* COLOR COMPUTER

USE FUNDGRAF AND FUNDFILE

FUNDGRAF is a stock market analysis program that not only graphs and analyzes funds or stocks, but also makes decisions on when to BUY and SELL. Improve market timing using your COCO.

GRAPHS fund's progress (up to 200 weeks). SUPERIMPOSES for comparison: a line of constant percent growth or a graph of any other fund (or stock).

CALCULATES over any time span: the percent price change and the moving average (any span). INDICATES BUY and SELL signals. FUNDGRAF requires 16 K ECB min.

FUNDGRAF—A STOCK
MARKET ANALYSIS
PROGRAM FOR 16K EX
TRS-80 COLOR COMPUTER

TAS-80 COLOR COMPUTER - TM TANDY CORP

FUNDFILE is a portfolio and account management program for securities. Manage single or multiple portfolios of stocks, mutual funds, bonds, money market funds, etc. FUNDFILE allows easy maintenance of all your records for accurate portfolio evaluation. NEW 32 K VERSION of FUNDFILE summarizes all transactions (dividends, interest, purchases and sales) between any two dates of your choice—weekly, yearly, etc. Categorizes interest and dividends paid as to tax liability (tax free, etc.) and capital gains as long or short term. Great for tax reports.

FUNDFILE REQUIRES 16 K ECB min. and 80-COL PRINTER.
5-in. Diskette only for 16 K ECB

5-in. Diskette only for 16 K ECB \$27.95 5-in. Diskette only for 32 K ECB \$37.95 ADD \$2 handling on all orders.



Write for free brochure for details. Dealer inquiries invited.

PARSONS SOFTWARE, DEPT. G 118 WOODSHIRE DRIVE PARKERSBURG, WV 26101

OS-9™ SOFTWARE FOR COCO

SDISK—Standard disk driver module allows the use of 35, 40, or 80 track single and double sided drives with CoCo OS-9 plus you gain the ability to read/write/format the standard OS-9 single and double density disk formats used on other OS-9 systems. \$29.95

BOOTFIX—To make bootable double-sided disks \$9.95

SDISK + BOOTFIX—when ordered together \$35.95

FILTER KIT #1—Eleven utilities used as filters (with pipes) to give you "wild card" directory lists, copies, deletes, moves, lists, pagination, etc. \$29.95

FILTER KIT #2—Command Macro Generator to build new commands by combining old ones, and 9 other utilities. \$29.95

HACKER'S KIT #1—Disassembler and memory dump/fill utilities allow you to disassemble OS-9 assembly code from disk or memory. **\$24.95**

Send SASE for current catalog. Terms: Prepaid check, MO, Visa, Mastercard or COD. Add \$1 S&H, (COD \$3 extra).

D.P. Johnson, 7655 S.W. Cedarcrest St. Portland, OR 97223 (503) 244-8152

(We appreciate your calling between 9-11 AM Pacific Time.)

OS-9 is a trademark of Microware and Motorola Inc.

job with the User Group's membership committee. They have just completed a new database that contains the name and address of each member. Things are looking up for the group.

Here are two BASIC09 utility programs that should help you get your feet wet with BASIC09. They were contributed by Adrianus C. Hoogenraad of Kansas City, Mo. Remember, if you have a short routine you would like to share with other "KISSable OS-9" readers, send it to us at THE RAINBOW. We'll try to get it in as soon as possible.

DUMPM

Adrianus wrote this program before he realized the *OS-9 DUMP* utility had an "-L" option. You can use it to dump a file to the printer or the screen.

When you start it, *DUMPM* asks if you want to dump to the printer or screen. Next, it asks for a pathlist. Here, you enter the pathlist to the directory that contains the file. It will give you a directory of that pathlist and ask you if you want another pathlist.

If you have the right directory, you'll be asked for the name of the file you would like to dump. If you asked for the printer earlier, *DUMPM* will dump out 16 addresses per line. It dumps eight addresses per line on your screen. Both modes display the ASCII values of characters at the end of each line. When the program is finished, it asks you if you want to dump another file.

Del_file

Del_file was just a "fool-around" program designed by Hoogenraad. It gives you another way to delete files from your disks.

This program runs much like *DUMPM*. First, it asks for a pathlist, then displays a directory. It then asks you for the name of the file you would like to delete; after you type the name, it deletes the file and asks if you want to delete another.

These two programs were my first experience with BASIC09. I wanted to write a program with no line numbers, GOTO statements or GOSUB statements. Again, I wrote *DUMPM* because I didn't know the "-L" option was available. If I had known that, I probably wouldn't have written the program, but it was a very good learning experience, anyway.

That's all for March. Have a good month and we'll see what we can cook up for April.

```
PRINT #device," "
PRINT #device," "
CLOSE #path

IF output=1 THEN
CLOSE #device
ENDIF

PRINT "Want another dump? "
GET #0,answer
IF answer="y" OR answer="Y" THEN
RUN dumpm
ELSE
ENDIF
END
```

Listing 2:

```
PROCEDURE del file
REM An alternate to deleting files from your
REM diskettes.
REM
REM Written by:
REM A. Hoogenraad
REM 4316 Ditzler
REM Kansas City, Missouri 64133
REM
REM version 1.0
REM October 14, 1984
DIM answer: STRING[1]
DIM filename: STRING
DIM pathlist:STRING
SHELL "load del"
LOOP
PRINT CHR$(12)
INPUT "Enter pathlist: ", pathlist
SHELL "dir "+pathlist
PRINT "Delete any of these files? ";
GET #0, answer
IF answer="y" OR answer="Y" THEN
PR INT
INPUT "Enter filename: ",filename
pathlist:=pathlist+"/"+filename
SHELL "del "+pathlist
ELSE
PRINT
ENDIF
PRINT
PRINT "Delete another file? ";
GET #0, answer
EXITIF answer="n" OR answer="N" THEN SHELL "unlink del"
ENDEXIT
ENDLOOP
END
```

OS-9 UTILITY

RESTORING YOUR OS-9 FILE

Now you can recover that deleted file

By Brian A. Lantz



ver have something like this happen? Delete the wrong file, thinking you had a readable backup that only produces an I/O Error?

In Extended Color BASIC this has happened to me many times, as it may have to you. Fortunately, a long time ago I figured out how to painfully recover the file(s). If this

has happened to you more than once, you may have also.

But what about under OS-9? If you are like most OS-9 users (not just CoCo OS-9 users), you are totally lost when it comes to recovering a deleted file. What's that? You say only a dummy has that happen! Only a beginner!

I can disprove that by using an incident that happened to a friend of mine as an example. This friend is a computer professional from way back. Almost two decades ago he was involved in the development of one of the finest educational languages developed to date. He helped design one of the largest computer installations I have ever seen. What this man doesn't know about computers doesn't need to be known! Surely something like this could not happen to a knowledgeable, computer professional like this, right?

He was in the process of cleaning up his hard disk when someone distracted him. Instead of typing in the entire line, he typed:

DELDIR . ENTER

Murphy's law took its turn again as he looked at the terminal to see:

Deleting directory file
List directory, delete directory, or
quit?

(1/d/q)—

(Brian Lantz is a software engineer and consultant. He is the author of OS-9 Textools, OS-9 Databank™, Unicharger and other software currently on the market)

Not knowing his previous mistake of an incomplete pathlist, he, of course, typed in a 'D' and entered. So, OS-9 proceeded to delete all the files in his current directory. This directory had the only copies of the source for a new version of a complete new language for OS-9. Before the mistake was noticed, over 16 files were deleted! I promptly received a desperate telephone call to help him out. The happy ending is that we were able to restore 16 out of 16 files, completely!

How to Save Deleted Files

Now for the "how-to" part. How can you save those valuable files if they happen to be deleted by mistake or accident?

First, the ideal tool needed: the PATCH utility command. This is available in the *Disk Fix & Utilities* package from Computerware. Other utilities can produce the same results, but I recommend using PATCH for the

"A File Descriptor is a one-sector information center for the file; each file has one, including directories. Several things are stored in the File Descriptor sector, including the file's attributes, the file owner's user number, the modification date and creation date, the file size and the segment list."

Example 1 .SP2 addr ofst 0 1 2 3 4 5 6 7 8 9 A B C D E F 02000000 0000 00 07 FA 10 01 40 00 01 00 00 03 00 00 FF 1A 9F ..z..e..... 00000020 0020 65 76 65 6C 20 49 49 20 38 30 20 54 72 61 63 6B evel II 80 Track 00000030 0030 20 53 79 73 74 65 6D 20 44 69 73 EB 00 00 00 01 System Disk.... 00000040 0040 01 03 00 03 00 50 02 00 00 10 00 0A 04 0B 00 8EP....... .SP3 .CE

least work and fastest recovery time. I will explain how to restore files using PATCH, but even if you don't have PATCH, the principles are the same.

Now for a little knowledge of how things are organized on the OS-9 disk. OS-9 doesn't refer to a disk by track number and sector number like most operating systems (i.e., FLEX). OS-9 uses a Logical Sector Number (LSN). The first sector of the disk is LSN 0, followed by LSN 1, etc. This is the way OS-9 can access different types of drives in the same way. No matter how many tracks and sectors it has, LSN 43 is the 44th actual sector of the disk.

The OS-9 directory is a little different from Color Disk BASIC, also. Each directory entry is 32 bytes long. The first 29 bytes are the filename. The last character of the filename has the Most Significant Bit set. The other three bytes are the pointer to the File Descriptor sector of the file.

A File Descriptor is a one-sector information center for the file; each file has one, including directories. Several things are stored in the File Descriptor sector, including the file's attributes (viewed with a DIR E), the file owner's user number, the modification date and creation date, the file size and the

segment list. The segment list is a table of five-byte entries that tell where the file's sectors are actually located, and how many sectors are in each segment.

End of Basic Training

Now, with the basics out of the way, let's go through the restoration process. The first thing that needs to be done is to enter the PATCH utility. Let's assume for our discussion that the deleted file was named *NEEDED.FILE*, and was located on drive /D0. We would enter the PATCH utility by typing:

PATCH /DOR

This opens the entire disk located in drive / D0 for patching. The next thing we see is the copyright notice, and the prompt, which looks like this:

OmegaSoft Patch utility version 2.20 Copyright 1983 by Certified Software Corporation — >

The first thing we want to do is locate the root directory for /D0. This information is located in LSN 0, along with several other useful tidbits. To do this, we use the 'D' option of PATCH. This will display in Hex and decimal the bytes requested. If only one number is given on the command line, then 256 bytes are displayed, starting with the byte requested. To display LSN 0, type:

-> D 0000

The result is Example 1. This is from one of my disks, and is actual output from PATCH. The root directory's File Descriptor sector is located in the eighth, ninth and tenth bytes of LSN 0, which, in this case, is 00 00 03. You will find that, with rare exceptions, the root directory's File Descriptor sector will always be this, but it is wise to check anyway.

In order to find a file, we must look at the File Descriptor, so let's tell PATCH what we want:

-> D 000000300

Note that we needed two additional zeros at the end. This is because LSNs refer to the number of sectors, not bytes. This PATCH command could have been given as:

-> D 0300

The result is Example 2. This is a typical File Descriptor sector. (I will not

take the space to describe all of what's here, just what concerns this article.) Notice bytes 9 through \$0C. These bytes, 00 00 01 20 in this example, are the file size in bytes, not sectors. If we were looking at the File Descriptor of a deleted file, these would all be zeros.

The other important bytes start at offset \$10. This is where the segment list table starts. Each segment list entry consists of five bytes. The first three bytes are the Logical Sector Number of the first sector of a block. The remaining two bytes are the length of the block in sectors. The entry following the last valid one must be all zeros. In this case, the LSN is 00 00 04 (or simply 4) and the length of the file in sectors is 00 02. Notice that \$0120 bytes become two sectors for the segment list.

Examine Directory

Now it's time to examine a directory. We know that the first segment starts with LSN 4, so we type:

-> D 0400

"We have fooled OS-9 into believing the file still exists, but the disk's sector map still believes the sectors deleted are available for use. This means the first time a file is created or edited, it could overwrite our recovered file . . . "

you have created or edited files since *NEEDED.FILE* was deleted, the data from the file is almost a cinch to find ("almost" will be explained below).

Rather than take all the "fun" out of recovering your first file, I'll just describe most of the rest. The next step is to read the file's File Descriptor

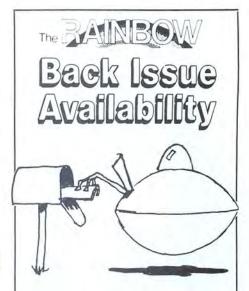
Example 2 .SP2 addr ofst 0 1 2 3 4 5 6 7 8 9 A B C D E F 00000300 0300 BF 00 00 54 0A 1F 15 1C 02 00 00 01 20 00 00 00 ?..T...... .PG .SP3 . CE

and now we have Example 3. This is a typical directory listing. In it we find the remains of the *NEEDED.FILE*. As you can see, when a file is deleted in OS-9, the first byte of the filename is changed to a zero. This is the same as with Color Disk BASIC. The rest of the directory entry is left unchanged. This is what helps us to recover the file.

Notice the last three bytes of the entry for *NEEDED.FILE* at offset \$04DD-\$04DF. These bytes are the LSN of the old file's File Descriptor sector. Unless

sector. Mark down where the File Descriptor is located, since you will need to come back here later on. This part of the segment list is left intact.

When a file is deleted, the first LSN is left in the segment list, but its block size is erased. This, in itself, is not so bad. The trouble is that any other segment list that may have been there originally is erased, also. This is not a problem if the file was in one segment, but if it was fragmented, then you are now on a scavenger hunt to find your



Back copies of many issues of **THE RAINBOW** are still available.

All back issues sell for the single issue cover price. In addition, there is a \$3.50 charge for the first issue, plus 50 cents for each additional issue, for postage and handling if sent by United Parcel Service. A \$4 charge plus \$1 each additional copy for orders sent U.S. Mail. UPS will not deliver to a post office box or to another country.

Issues July 1981 through June 1982 are available on white paper in a reprint form. All others are in regular magazine form. VISA, MasterCard and American Express accepted. Kentucky residents please add 5 percent state sales tax. We do not bill and no C.O.D. orders accepted.

Due to heavy demand, we suggest you order back issues you want now while supplies last.

To order, just fill out the form on the next page and mail it with your payment to:

THE RAINBOW

9529 U.S. Highway 42 P.O. Box 385 Prospect, KY 40059

BACK ISSUE ORDER FORM

(See overleaf for instructions.)

☐ Please send me the following back issues:

(Payment must accompany back issue orders. We do not bill.)

MONTH	VOLUME 1	
NO. YEAR		PRICE
1 JULY '81	PREMIER ISSUE	\$2.00
2 AUG. '81	EDUCATION	\$2.00
3 SEPT. '81	EDUCATION	\$2.00
A OCT '81	PRINTER	\$2.00
5 NOV. '81		\$2.00
5 NOV. '81 6 DEC. '81 7 JAN. '82	HOLIDAY	\$2.00
7 JAN. '82		\$2.00
8 FEB. '82		\$2.00
9 MAR '82 10 APR '82		\$2.50
12 JUNE '82		\$2.50 D
IE SOIVE DE	VOLUME 2	\$2.50
8 FEB '83	BUSINESS	\$2.95
9 MAR. '83	NUCLEAR	\$2.95
10 APR. '83 11 JUNE '83	SIMULATIONS	\$2.95
11 JUNE 83	PRINTERS	\$2.95
12 JULY '83	ANNIVERSARY	\$2.95
1 AUG '83	VOLUME 3 GAMES	\$2.95
2 SEPT '83	EDUCATION	\$2.95
3 OCT. '83	GRAPHICS	\$3.95
4 NOV '83	DATA COMM.	\$3.95
3 OCT. '83 4 NOV '83 5 DEC. '83 7 FEB. '84	HOLIDAY	\$3.95
7 FEB. '84	ADVENTURE	\$3.95
8 MAR '84		\$3.95
9 APR. '84 10 MAY '84	GAMING PRINTER	\$3.95 □ \$3.95 □
11 JUNE '84		\$3.95
12 JULY '84	ANNIVERSARY	\$3.95
	VOLUME 4	
1 AUG '84	GAMES	\$3.95
A CERT 'DA	EDUCATION	\$3.95
3 OCT '84	GRAPHICS	\$3.95
4 NOV 84	DATA COMM.	\$3.95 □
3 OCT '84 4 NOV '84 5 DEC '84 6 JAN '85 7 FEB. '85	HOLIDAY BEGINNERS	\$3.95 D
7 FEB. '85	UTILITIES	\$3.95
8 MAR. '85	BUSINESS RAINBOW INDEX	\$3.95
U.S.	MAIL CHARGE	
	SIDENTS ONLY ADD 5%	
	ADD 5%	#######################################
	ADD 5%	HONE #
	ADD 5%	PHONE #
	ADD 5%	PHONE #
	ADD 5%	
	ADD 5%	
	ADD 5%	CARD #

segments! This is not impossible, it just seems like it is. Under normal circumstances, this should be the exception, not the case.

Normally, the only trick to restoring a file is finding where the file ends, and thus its length. With source files, this is a snap! Once you have the file's length, go back to the File Descriptor sector.

Now you get to use another of PATCH's options, that of modifying bytes on the disk. First, we need to modify the four bytes starting with offset 9 of the sector to tell the Descriptor how long the file really is. Type:

-> M 5D09

if the sector happens to LSN 59, or the appropriate address. Now the address of the byte, along with its current value, is displayed. To change it, enter in the new value. When you are done with the

at offset \$13 of the sector, so we would have this occur:

-> M 5D13 00005D13 00 00 00005D14 00 04 00005D15 00 /

Only one thing remains for OS-9 to be able to find the file: We must change the original directory entry. Go back to the directory sector and change the first byte of the filename back to its original value. You can now exit PATCH (with 'Q') and do a DIR of / D0, and lo and behold, NEEDED. FILE now exists. LIST it and see!

We have fooled OS-9 into believing the file still exists, but the disk's sector map still believes the sectors deleted are available for use. This means the first time a file is created or edited, it could overwrite our recovered file with the new file.

```
Example 3
.SP2
addr ofst 0 1 2 3 4 5 6
        8
        9
         ABCDEF
       7
00000440 0440 4F 53 39 42 6F 6F F4 00 00 00 00 00 00 00 00 DS9Boot......
00000480 0480 53 50 45 4C CC 00 00 00 00 00 00 00 00 00 00 00 SPELL.....
000004C0 04C0 00 45 45 44 45 44 2E 46 49 4C C5 00 00 00 00 .EEDED.FILE....
```

last of the four bytes, enter a '/' (slash) on the next line, and you will return to the normal PATCH prompt. If the length of the fictitious file was \$0348, the display will look something like this:

-> M 5D09
00005D09 00 00
00005D0A 00 00
00005D0B 00 03
00005D0C 00 48
00005D0D 54 /

Now we must add to the segment list. The file size for the first segment starts But, don't go away mad! Now, all you need to do is COPY this file onto another disk. OS-9 can do that now. It *thinks* the file exists. After copying it onto another disk, you need to remodify the file back to the way you found it, so as not to confuse the operating system.

This may sound like a lot of trouble — well, it is! But so is losing valuable data or programs. Not all files will be worth the trouble, but for the ones that are, this method works exceptionally well. If nothing else, you now have a better understanding of file organization under the OS-9 operating system.

DIGISECTOR DS-69 VIDEO DIGITIZER FOR THE COCO



Give your COCO the gift of sight!

The Micro Works is happy to introduce the newest member of our Digisector[™] family — the DS-69 Video Digitizer for your COCO. It has all the standard features of its big brothers but comes with a price tag that's right for you.

- High Resolution 256 by 256 spatial resolution.
- Precision 64 levels of grey scale.
- SPEED! ½ second for a full screen of video.
- Compactness Self contained in a plug in Rompack.
- Ease of Use Software on disk will get you up and running fast!



The DS-69 Digisector opens up a whole new world for you and your COCO. Your computer can be a security system, take portraits, analyze signatures, inspect assembly work . . . the DS-69 is your COCO's

eyes. Use the DS-69 and a TV camera to get fast, precise conversion of video signals into digital data.

Powerful C-SEE™ software.

C-See is a menu-driven software package included with your DS-69. It provides high speed 5 level digitizing to the screen, high precision 16 level digitizing for superb hard copy printout, and simple software control of brightness and contrast. Or call our driver rou-

tines from your own Basic program for easy 64 level random access digitizing. Pictures taken by the DS-69 may be saved on disk by C-See and then edited by our optional MAGIGRAPH package for enhancements and special effects.



The DS-69 comes with a one year warranty. C-See supports both cassette and disk operation with the Multi-Pak adaptor and requires 64K. Cameras and other accessories are available from The Micro Works. Let your COCO see the World!

■ DS-69 Digisector & C-See Software

\$149.95

■ MAGIGRAPH Graphics Package on disk Terms: Visa, Mastercard, Check or C.O.D.

\$ 39.95

Purveyors of Fine Video Digitizers Since 1977.

The CRO

WORKS

Established 1977

P.O. Box 1110

Del Mar, CA 92014

(619) 942-2400

THESE FINE STORES **CARRY THE RAINBOW**

The retail stores listed below carry THE RAINBOW on a regular basis and may have other products of interest to Color Computer users. We suggest you patronize those in your area.

ALABAMA

Birmingham Brewton Florence Huntsville Madison

Endicott Software Madison Books Montgomery Trade 'N' Books ALASKA

Fairbanks ARIZONA

Scottsdale

Tempe

Home Brew Computers The Computer Shop Tri-Teck Computers Data Concepts Softwareland Corp All Systems Go Books Etc.

Tucson ARKANSAS

Little Rock Anderson News Co.

CALIFORNIA Citrus Heights FI Caion Exton Folsom Ft. Bragg Fortung Gretna Half Moon Bay Hesperia Hollywood Livermore Lompoc Los Angeles Milpitas

National City Pacific Beach Palo Alto Sacramento San Diego

Santa Rosa Southgate Stockton Sunnyvale COLORADO

Aurora Colorado Springs Westminster

CONNECTICUT Monroe Orange

DELAWARE

Wilmington FLORIDA

Altamonte Springs Baca Raton

Cocoa Ft. Lauderdale Jacksonville

Kissimmee Madison Melbourne

Miami Orange Park Orlando

Sewell TV & Radio Shack Jefferson News Co. McDowell Electronics Anderson News Co.

Electronic World

Computer Library Anderson News Co. Minz Electronics

Software Plus The Floppi Disk Radio Shack Software City Computers, Etc. Earthly Delights **R&V Sound** The Computer Supply Store Strawflower Flectronics Dessert Sound, Inc. Levity Distributors Software Galeria L&H Electronics Emporium Polygon Co. **AVS Computer Systems** JARB Software Willy's Electronics Pro Am Electronics

Printers, Inc. Tower Magazine Computer Dimension The Computer Store Dimensional Software Disney's Electronics Radio Shack Sawyer's News, Inc Color Computing Hardings Way News Computer Literacy

Aurora Newsland

Hathaway's Magazines Software City

Computer Serv. of Danbury Monroe-Radio Shack Software City

Normar, Inc.—The Smoke Shop

International Music & Recording Software Software Inc. The Avid Reader Soenen & Wilmoth Books Software City Village Book Shop Software Plus More Mike's Electronics Distributor

Software Connection The Book Nook Book Town Radio Shack & Elec. Hut Electronics of Madison City Newsstand The Little Store The News Rack

Software City The Alamo Berne Garrett Software Unlimited

Panama City

Pensacola Pinellas Park Sarasota South Pasadena Stuart Tallahassee Tampa

Atlanta

Bremen

Jesup

St. Simons Island

Blackfoot

Champaign

Chicago

Moscow

ILLINOIS

Toccoa

IDAHO

Boyd-Ebert Corp. Computer Systems Group Anderson News Co. Wolf's Newsstand Family Computers

Poling Place Caribbean Engineering Corp. Anderson News Co. Fine Print Bookstore Software City Sound Trader & Computer Center

GEORGIA Chips, Inc. Guild News Agency Software City Boogie Shoppe Augusta Muscogee News Co. Kent Radio Shack Columbus Cummings Kannon Music Radio Shack Marietta Act One Video

> Radio Shack Martin Music Radio Shack

F/M Systems Electronics Johnson News Agency

Kroch's & Brentano's Book Market B. Dalton Booksellers N. Walbash St West Jackson St Bob's in Newtown

Bob's Rogers Park **Book Market** East Cedar North Cicero West Diversey E.B. Garcia & Associates Guild Books & Periodicals Kroch's & Brentano's South Walbash

Bob's News Emporium

West Jackson 516 N. Michigan 835 N. Michigan Parkway Drugs Parkwest Books Sandmeyer's Bookstore Univ. of Chicago Bookstore Univ. of Illinois Bookstore

DeKalb Fast Moline Evanston Geneseo Kewanee Lisle Newton Oak Brook

Chillicothe

Decatur

Oak Park Peoria

Schaumberg South Holland Springfield

Sunnyland West Frankfort Wheeling INDIANA

Videomat, Inc. Book Emporium Book Market Book Emporium K-Mart Plaza Northgate Mall Appletree Computers Book Emporium Chicago-Main News B & J Supply Book Emporium Book Nook Bill's TV Radio Shack Kroch's & Brentano's B.I.E.S. Systems Kroch's & Brentano's Book Emporium Book Emporium Sheridan Village Westlake Shopping Center Book Market Illinois News Service

Kroch's & Brentano's Kroch's & Brentano's Abacus Computer Distributors Book Emporium Sangamon Center North Town & Country Shopping Ctr. Book Emporium Paper Place North Shore Distributors

White Cottage Electronics Finn News Agency, Inc

Greenwood Indianapolis

Jasper Lawrenceburg Madison

Marion Martinsville New Haven Scottsburg Walbash

Bettendorf Davenport

KANSAS Junction City Topeka

Wichita

KENTUCKY Bardstown Greenville

Hopkinsville Louisville Maysville Paducah **Paintsville** Pikeville Princeton

LOUISIANA

Crowley Shreveport Slidell

MAINE Bangar Brockton South Portland Waterboro

MARYLAND

Lexington Park MASSACHUSETTS

Brockton Cambridge

Danvers Fitchburg lpswich Littleton Lynn Woburn

MICHIGAN Allen Park Ann Arbor Brooklyn Charlotte Dearborn Durand Fenton

Kalamazoo Lapeer

Lowell Mt. Clemens

Mt. Morris Muskegon Okemos Owosso

Pontiac Roseville Royal Oak St. Johns Southfield

The Computer Experience Indiana News Computer Store Elex Mart Bauer Electronics Arcs Office Supplies Computer Corner

Radio Shack Advanced Color Software Radio Shack of Scottsbura Mitting's Electronics

Cosmos Computers Interstate Book Store Software City

III H's Stereo Palmer News, Inc. Town Crier of Topeka, Inc. Amateur Radio Equipment Co. Lloyd's Radio

Skaggs Electric/Radio Shack Williams & Wells, Inc. Hobby Shop The Computer Store Radio Shack Radio Shack Gus-Stan Enterprises Gus-Stan Enterprises Miller Electronics

Acme Book Co. Software Solutions Acadiana Newsstand Computer SOS Radio Shack 7181

Magazines, Inc. Voyager Bookstore Portland News Co.

Radio Shack

Books, Etc.

Vogager Bookstore Ninis Corner, Inc. Out Of Town News The Program Store Microcon Computer & Software Store Corners Book Shop

loswich News Computer Plus North Shore News Co. Microcon Softwarecenters

Book Nook, Inc. Community News Center Weatherwax Radio Shack Computer Options **DSI** Computer Products Robbins Electronics Tri-County Electronics Radio Shack John Rollins Software City Computer Corner

User Friendly
Curt's Sound & Home Arcade Center Key Book Shop Michigan Radio Shop And Save The Eight Bit Corner MI Software Dist., Inc. Software City

C/C Computer Systems Hi-Fi Audio Co. Perry Computers Perry Oil & Gas Computer Shack New Horizons Software City Clinton Electronics Software City

Sterling Heights Brunner News Agency Edu-Caterers AUSTRALIA: Lima Sterling Book Center SYDNEY Kingsford Wyoming Gerry's Book Co. Paris Radio Electronics Mayfield Heights Miamisburg Software City MINNESOTA CANADA: Wilke News Mount Orab Radio Shack Minneapolis Read-More News ALBERTA Mount Orab McLeans Ltd. Banff Radio Shack Athabasca Programs Unlimited Leo's Book & Wine Shop MISSISSIPPI Rocky River Banff Stereo Store of Grenada, Inc. Barrhead Sound 1982 Ltd. L & K Sports & Music Double "D" A.S.C. Radio Shack Billy's News Grenada Toledo Barrhead Gulfport Computerland Reitz Electronics Blairmore Home Computer Store Westerville MISSOURI Brooks Midwest CoCo Systems OKLAHOMA Kansas City Calgary Imperial Computer Ltd. Rainbow Software Services St. Louis Book Emporium Shortgrass Electronics Hobart Softwaire Centre Oklahoma Computer Xchange Softwaire Centre Radio Shack Associated Stores Radio Shack Associated Stores City Merit Micro Software Camrose Claresholm OREGON Coaldale Sight & Sound Langard Electronics CMD Micro Kelly Software Distributors University City Final Edition Coaldale Drayton Valley B. Color Computer and Software Aloha NEBPASKA Lee's TV & Radio Clinic 80-Plus Hermiston Edmonton Hobby Town Lincoln Portland Omaha Computers & Components Radio Shack D.N.R. Furniture & TV PENNSYLVANIA Edson NEVADA Allison Park Software City Newborn Enterprises Fairview **Hurley Electronics** Fox Creek Fox City Color & Sound Las Vegas Altoona Brookville Larry's Stereo Shop Weiss Computers Ft. Macleod Fort Pharmacy NEW HAMPSHIRE Radio Shack Coudersport BRW Electronics/Radio Shack Peterborough Greensburg The Program Store Harrisburg News Co. Grande Portsmouth Computers Verham News Corp. Portsmouth Cache The Stereo Hut Harrisburg West Lebanon Personal Software City Software Center Grande **NEW JERSEY** The Book Nook Philadelphia Centre Grande Prairie Cedar Knolls Cherry Hill Village Computer & Software Software City Northern Computer Service Technics TV Ltd. Newsy Stevens Radio Shack Phoenixville Hanna All-Pro Souveniers
Pitt Computer & Software Clinton Micro World II Pittsburgh Pleasant Hills Innisfail L & S Stereo Software City Tall Pine TV Flemington Lacombe Lawrenceville Linwood Micro Con Software Center Software City Pottstown Video Programming, Inc. Leduc Radio Shack Associated Stores Lloydminster Lloyd Radio Shack Shippensburg Rainbow Adventure Marmora Outpost Radio Shack Tunkhannock The Donna Comm. Co. H & S Music Centre Peace River Montvale Software City Radio Shack Associated Stores Williamsport Shade Tree Software City Dave's Elect. Radio Shack Thornton & Son's Gale Distributing Morristown The Computer Center of York Pincher Creek York Pennsville Redcliff RHODE ISLAND River Edge Software City Software Station Red Deer Computer World Newport Warwick Kelly's Variety Rockaway Roy's TV Tele-Logic Sundre Sound Rimbev Software Connection St. Paul Summit Software City Software City Teaneck SOUTH CAROLINA Sundre Pynewood Sight & Sound Don's Radio Shop Wayne Software Wayne Data Byte Computer Center Taber Beaufort Software Haus, Inc. Palmetto News Co Vallevview Charleston Hts. NEW MEXICO Vermillon Photocraft Vermilion Ltd. Greenville New Horizons Computer Systems Alamogordo Megatron Corporation Software City Hilton Head Wetaskiwin Radio Shack Albuquerque East West Enterprises Page One Newsstand Spartanbura BRITISH COLUMBIA Fleming's Electronics Union Salt of the Earth Sound Center — Radio Shack Burnaby Compulit Los Alamos Campbell TENNESSEE TRS Electronics River Anderson News Co. NEW YORK Chattanooga Chilliwack Charles Parker Lift Bridge Book Shop, Inc. Southern Tier News Co., Inc. Software City Dickson Highland Electronics Brockport Knoxville Anderson News Co. Courtenay Bell Radio & TV Elmira Heights Valley Computers Ken Dawson Merrit Radio Shack First Byte Computer Co. Computer Center Fairport Ft. St. John Memphis Hudson Falls G.A. West & Co. Software, Inc. Stewart Software Merrit Johnson City Unicorn Electronics N. Vancouver Microwest Distributors Software City
Barnes & Noble—Sales Annex Mt. Kisco Campus Computer Corp. Mosko's Book Store Sicamous Sidney Nashville Shuswap Electronics New York Sidney Electronics Coliseum Books Software First Delker Electronics Victoria Datafact Eastern Newsstand International Software Grand Central Station, Track 37 Smyrna Techworld Norcom Software 200 Park Ave., (Pan Am #1) 55 Water Street TEXAS Williams Lake Elgin Ft. Worth The Homing Pigeon World Trade Center #2 RFI Electronics MANITOBA First Stop News Jodi's Sight & Sound J & J Electronics Ltd. Software Terminal The Pas Idle Hours Bookstore Houston MicroSolutions Winnipeg International Smoke Shop Software Access Northway Books & News Irving **NEW BRUNSWICK** Jonil Smoke Orange Canadian Colour Connection Penn Book Moncton Paris Software Solutions State News Usercom Systems, Inc. NEWFOUNDLAND HATII Labrador City Sound & Vision Murray Deseret Book Walden Books World Wide Media Services NOVA SCOTIA Ogden Computer City Dartmouth Sector Software Software City Adirondack Computer Supplies N. White Plains VIRGINIA Halifax Atlantic News Plattsburg Gafton Electronics Marketing Rocheste Village Green World Wide News ONTARIO Norfolk **I-O Computers** Richmond Software City Micro Computer Service Angus Woodhaven Spectrum Projects Atikokam Gill's Furniture Bowmanville Audio Vision LTD WASHINGTON Bowmanville NORTH CAROLINA Software City Bellevue Cochrane Frederickhouse Sound King Electronics Aberdeen Marysville More Than Games Etobicoke NEPCOM Radio Shack Newsstand Int'l Mount Lake Galls Book World Charlotte Hamilton Terrace **Emerald Computer Services** Hanover CMUG Papers & Paperback Computer Concerns C² Books & Comics Renton Data Borne Kinaston T.M. Computers National News Co., Ltd. Havlock Adams News Co., Inc. Nybbles 'N Bytes Seattle Ottawa Hickory Laurinburg Tacoma Radio Shack South River Max TV Strathroy WEST VIRGINIA Downtown Sound Marion Newland Boomers Rhythm Center Pioneer Technology Stan's Electronics & Radio Shack Lesage Alpine Electronic Systems QUEBEC Logan Parkersburg Messageries de Presse Benjamin Enr. Soc. De Loc Raleigh D.J.'s Book and News LaSalle Valley News Service Softmart Sherbrooke Total Data Systems K & S News Stand Sylva Winston-Salem WISCONSIN **SASKATCHEWAN** Badger Periodicals Appleton Telstar News Assiniboia Cudahy News & Hobby Book World Electronics, Etc. **NORTH DAKOTA** Cudahy Janesville Cornerstone Sound George Glass Nipiwan Fargo Computer Associates Regina Ladysmith Regina CoCo Club Softwre Supermarket OHIO Milwaukee Abacus Micro Canton Cincinnati Little Professor Book Center Book Tree Booked Solid Computertime Paul's Service Saskatoon Cinsoft Utopia Software Tisdale Coshocton Booked Solid II Wilke News Dayton Harvey Schwartz Bookshop YUKON News-Readers Gal-Tronics Fairborn Bia Byte Computer Services Univ. of Wisconsin Bookshop Whitehorse

Also available at all Waldenbooks, Coles and selected B. Dalton Bookseller stores in the United States and Canada.

The Computer Store

WYOMING

Galion

Lakewood

Kent Kenton The News Shop

T.W. Hogan & Associates

Lakewood International News

H & O Holdings

Software City

PUERTO RICO

San Juan

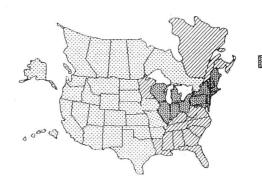
ADVERTISER'S INDEX

We encourage you to patronize our advertisers — all of whom support the TRS-80 Color and TDP System-100 computers. We will appreciate your mentioning **THE RAINBOW** when you contact these firms.

Alban Scientific143
Alpha Products
Ankia Research
Ark Royal Games
B & B Software
B5 Software56
Baumann
Bee Color Computer
Betasoft Systems8
Big 3, The
Botek Instruments 248
Cer-Comp
Cinsoft
CNR Engineering
Color Software Services
Colorware
CompuServe
Computer Center
Computer Center
Computer Plus
Computer Systems Distributors 222
Computerware
Computize, Inc
Cosmos Computer Services Inc80
Custom Computer Products 190
Custom Software Engineering96
Data-Comp53 Datafact Software LTD224
Dataman International 95 234
Dataman International95, 234 Dayton Associates of W. R. Hall, Inc. 184
Deft Customs 17
Dell Systems
Deft Systems
Delker Electronics 62
Delker Electronics
Delker Electronics .62 Derby City Software .210 Derringer Software .22, 23, 113, 192 Dorsett Educational Systems .66 Double Density Software .84, 85 Dragon User .154 Dragonfly Writing .103 DSL Computer Products .215 Duggers .117 DYNACALC .75 E.D.C. Industries .258 EAP Co .104 Elite Software .99, 100, 101 Endicott Software .204 Essential Engineering .198 Federal Hill Software .24, 193 Four Star Software .183 GIMIX .274 GRAFX .137 Grantham Software Division .65 Great Plains Computer Co., Inc. .254 Green Mountain Micro .201 Hard Drive Specialists .191 Hawkes Research Services .209 HJL div. of Touchstone .130 Technology, Inc. .130 Frank Hogg
Delker Electronics .62 Derby City Software .210 Derringer Software .22, 23, 113, 192 Dorsett Educational Systems .66 Double Density Software .84, 85 Dragon User .154 Dragonfly Writing .103 DSL Computer Products .215 Duggers .117 DYNACALC .75 E.D.C. Industries .258 EAP Co .104 Elite Software .99, 100, 101 Endicott Software .204 Essential Engineering .198 Federal Hill Software .24, 193 Four Star Software .183 GIMIX .274 GRAFX .137 Grantham Software Division .65 Great Plains Computer Co., Inc. .254 Green Mountain Micro .201 Hawkes Research Services .209 HJL div. of Touchstone .209 Technology, Inc. .130 Frank Hogg Laboratory .IBC Howard Medi
Delker Electronics .62 Derby City Software .210 Derringer Software .22, 23, 113, 192 Dorsett Educational Systems .66 Double Density Software .84, 85 Dragon User .154 Dragonfly Writing .103 DSL Computer Products .215 Duggers .117 DYNACALC .75 E.D.C. Industries .258 EAP Co .104 Elite Software .99, 100, 101 Endicott Software .204 Essential Engineering .198 Federal Hill Software .24, 193 Four Star Software .183 GIMIX .274 GRAFX .137 Grantham Software Division .65 Green Mountain Micro .201 Hard Drive Specialists .191 Hawkes Research Services .209 HJL div. of Touchstone .130 Technology, Inc. .130 Frank Hogg Laboratory .18C Howard Medical
Delker Electronics .62 Derby City Software .210 Derringer Software .22, 23, 113, 192 Dorsett Educational Systems .66 Double Density Software .84, 85 Dragon User .154 Dragonfly Writing .103 DSL Computer Products .215 Duggers .117 DYNACALC .75 E.D.C. Industries .258 EAP Co .104 Elite Software .99, 100, 101 Endicott Software .204 Essential Engineering .198 Federal Hill Software .24, 193 Four Star Software .183 GIMIX .274 GRAFX .137 Grantham Software Division .65 Green Mountain Micro .201 Hard Drive Specialists .191 Hawkes Research Services .209 HJL div. of Touchstone .130 Technology, Inc. .130 Frank Hogy Laboratory .18C Howard Medical
Delker Electronics .62 Derby City Software .210 Derringer Software .22, 23, 113, 192 Dorsett Educational Systems .66 Double Density Software .84, 85 Dragon User .154 Dragonfly Writing .103 DSL Computer Products .215 Duggers .117 DYNACALC .75 E.D.C. Industries .258 EAP Co .104 Elite Software .99, 100, 101 Endicott Software .204 Essential Engineering .198 Federal Hill Software .24, 193 Four Star Software .183 GIMIX .274 GRAFX .137 Green Mountain Micro .201 Hard Drive Specialists .191 Hawkes Research Services .209 HJL div. of Touchstone .204 Technology, Inc. .130 Frank Hogg Laboratory .1BC Howard Medical .34, 221 Incentive Software
Delker Electronics .62 Derby City Software .210 Derringer Software .22, 23, 113, 192 Dorsett Educational Systems .66 Double Density Software .84, 85 Dragon User .154 Dragonfly Writing .103 DSL Computer Products .215 Duggers .117 DYNACALC .75 E.D.C. Industries .258 EAP Co .104 Elite Software .99, 100, 101 Endicott Software .204 Essential Engineering .198 Federal Hill Software .24, 193 Four Star Software .183 GIMIX .274 GRAFX .137 Grantham Software Division .65 Green Mountain Micro .201 Hard Drive Specialists .191 Hawkes Research Services .209 HJL div. of Touchstone .130 Technology, Inc. .130 Frank Hogy Laboratory .18C Howard Medical

KRT Software
Mark Data Products 138, 139, 199
Metric Industries 40
MichTron
MichTron
Micro Data Systems73
Micro Works, The
Microcom Software
Microtech Consultants Inc255
Microware Systems Corporation 259
Microworld II
Microworld II
Moreton Bay
Northglenn Software Co210
NOVASOFT
Oelrich Publications220
Oelrich Publications
Owls Nest Software118
Owl-Ware
Parsons Software
PBJ, Inc63
PCM169
PD Software
Perry Computers168
Picosoft Games146
Polygon Co
Dr. Preble's Programs 194
Prickly-Pear Software86
PXE Computing15
R.G.S Micro Inc 156, 157, 250, 251
Radio Shack
Rainbow Adventure Contest 41
Rainbow Bookshelf70

Rainbow Gift Certificate2	26
Painhow On Tana	0
Rainbow On Tape	9
RAINBOWfest114, 1	1:
REM Industries	30
Saguaro Software1	
Software Connection2	1
Software House, The1	16
Software Plus	43
Software Support, Inc186, 18	87
South East Media24	
Spectral Associates	41
Spectro Systems	76
Spectrum Projects Inc.	
121, 122, 123, 125, 126, 127, 129, 29	57
Speech Systems 177, 178, 179, 180, 18	
Speech Systems 177, 176, 179, 160, 16	0
Sugar Software92, 93, 20	
Szili, Z	9:
T & D Software	14
TCE Programs, Inc	
Thinc	18
Tri-Tech Electronics	3
Triad Pictures	14
True Data Products230, 2	3
Undercolor2	4
Valley Micro	62
Vidtron	14
VIP Technologies (Softlaw Corp.)	
25 26 3	27
Wasatchware	16
Woodstown Flostronics	10
Workham Data Systems	
Workbase Data Systems	
YGS22	28
York 102	18



Call: Jack Garland Garland Associates, Inc. 10 Industrial Park Road Hingham, MA 02043 (617) 749-5852

Call:

Cindy Shackleford Director, West Coast Office 12110 Meridian South — Suite 8 P.O. Box 73-578 Puyallup, WA 98373-0578 (206) 848-7766 ZZZZ Call:

Kate Tucci Advertising Representative 9529 U.S. Highway 42 P.O. Box 385 Prospect, KY 40059 (502) 228-4492



See your screens magnified 2x, 4x, or 8x1 Draw or "touch up" in either color or B/W (hi-res) mode, Excellent for fine detail work.

Add type in 16 different sizes, over 50 colors of text, characters may be rotated or mirrored to allow typing in almost any direction.



Reposition graphics with precisio and ease "WRAP-AROUND" and ease "WRAP-AROL feature prevents graphics scrolling off the edge of the screen.

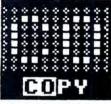


Enlarge or reduce any part of a screen by any amount, proportional or nonproportional. Rotation can be anything from 0 to 359 deg

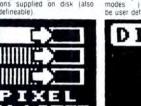
GRAPHICOM PART II-\$24.95



GRAPHICOM PART][is a menu-driven graphics utility that does not require the original GRAPHICOM to run. It includes many of the functions that are missing in GRAPHICOM and will load and save both STANDARD (binary) and GRAPHICOM format screens. GRAPHICOM PART][requires a 64K Color Computer or Color Computer II, and at least one disk drive. It supports 1 to 4 disk drives, keyboard or joystick input, COLOR or B/W (hi-res) operation, and 4 screen display modes. "OOPS" command provides recovery after mistakes, and allows experimenting. Supplied on disk with a 34 page



Reproduce and enlarge small areas of the screen with icons or patterns for backgrounds, logos, etc. Over icons supplied on disk (also user-defineable)



Substitute colors, swap BLUE and RED, remove WHITE (removing all color widens lines for painting!). create color separations



More than 50 different colored shades and patterns available (over 200 if you count the 4 display modes Additional patterns may



Load & save screens in either GRAPHICOM or STANDARD format. copy screens from one format to another Supports single or multiple (up to 4) disk drive system.

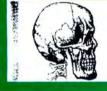














Input directly into Graphicom for easy enhancements, manipulation, stamping, and storage. Catalog all your favorite "video photos" of your friends, family, movie & TV characters on diskette.

Accepts composite video signal in (1.0v p-p) from video camera. VCR, video disc player, another computer, or other compatible video sources.

View "off air" or "VCR" digitized video at close to real-time. "Snapshot" video frames to the

digitizer's internal memory. No slow. "blurry" serial manipulation just hit your joystick s fire button! It's that simple.

ton' It's that simple.

Use with your multi-pak or a "Y" cable ("Y" cable available at \$19.95)

Video is input via a "BNC" connector. External controls for HORIZONTAL POSITION. VERTICAL POSITION. HORIZONTAL WIDTH. BRIGHTNESS. and CONTRAST (FUZZ) settings.

Don't be fooled by imitations. this is the GRAPHICOM VIDEO DIGITIZER the only digitizer that the only digitizer that

DON'T DE TODIES OF IMMAIONS THIS IN THE GRAPHICOM VIDED DIGITIZEN THE ONLY DIGITIZEN THE

DIDEG DIGITIZER (A \$50 VALUE)





E	-110-	TARRY	CG-1	160-6	5.1		-
		Pe is	fer te	pe ses	+ C1		
110-	150	700	€00	1200	2400	4500	9600
-	e unter	04/0	rate :	e legt	Det	recond	-
300 85	600 M	1200 10	THE	1570	5230 14 311	3530	

GRAPHICOM FONT PAGE

GRAPHICOM \$24.95

Simply stated - One of the finest graphic pro-grams written for the Color Computer!

- Simply stated One of the linest graphic programs written for the Color Computer!

 FEATURES

 U-S-E-R-F-R-I-E-N-D-L-Y '

 4 Display modes (Including Hi-Res red/blue artifact)

 Animate mode

 Color Palette with over 15 color patterns for use with Hi-Res artifact

 Send/Receive pictures over standard modern at 300, 600 or 1200 baud

 Supplied utility allows capturing Hi-Res screens from most COCO arcade games (even protected ones)

VISA

ones)

Multiple Hi-Res character fonts (user definable)

Supplied utility for transferring Graphicom screens to Basic or other M/L programs

Supplied utility for toading screens from Basic or other sources

Built in Hi-Res SCREEN PRINT (compatible with PEPSON, C-101H, GEMINI+10 OKI, plus Radio Shack's LP-VIII, LP-VIII, DMP-100, DMP-200, and GCP-115 printers) from 110 to 9600 baud Slow-Scan television SEND/RECEIVE options

Many additional features, operating hints, naroware mod s and Suggestions, etc.

* EASY TO LEASH ORAPHIC MENU *

REQUIRES SIX COOL 1 GBINE SYSTEM. AND 2 ANALOG JOYSTICKS



12C - ART DEMO FROM WHITESMITH



PICTURE DISKS \$9.95

Available from COMPUTIZE

- Artifact color palette
 Large character sets drawn with master 4C -
- design (from Derringer Software)
 Same as 5C but set up as stamp set
 Miscellaneous Art Set #1
 Miscellaneous Art Set #2

- Miscellaneous Ads and Examples Miscellaneous Fonts 11C · Artifact color palette type fonts
- 12C Art demo from WHITESMITH

Color Hi-res artworks from Whitesmith, the people that brought you Graphicom Part || introduced by an animated marching band performing a Sousa march in 4-part harmony!

13C - GRAPHICOM PART II function demo

GCII FONT DISKS

Each disk contains 40 or more font files (10 or more GRAPHICOM PART || fonts, 4 versions of each, one for each display mode), and three "FONT INDEX" screens to make identification and selection easy.

14C - GCII Fonts Disk #1 15C - GCII Fonts Disk #2 16C - GCII Fonts Disk #3





12C - ART DEMO FROM WHITESMITH



CALL OR WRITE FOR YOUR SAMPLE DIGITIZED PICTURE CATALOG TODAY!



Check of M.O. • Ado \$3.00 shipping • PA residents add 6% sales tax



ATTENTION COCO CLUBS CALL OR WRITE FOR INFORMATION ABOUT SOFTWARE DEMOS FOR CLUBS.

GIMIX STATE OF THE ART 6809 SYSTEMS FOR THE SERIOUS USER.



GIMIX has 19MB or high performance 47MB Winchester Drive Systems and/or Floppy Disk Drive Systems. For the user who appreciates the need for a bus structured system using STATIC RAM and powered by a ferro resonant constant voltage transformer.

GIMIX has single user systems that can run both FLEX and OS-9 or Multi user systems for

use with UniFLEX or OS-9.

GIMIX versions of OS9 and UniFLEX include maintenance and support by Microware (90 days) and TSC (1 year). Mainte-

nance and support after this period are available at extra

cost.

(NOTE: this support and maintenance is only for use with approved GIMIX hardware)

GIMIX 6809 systems support five predominant operating systems:

OS-9 GMX III,
OS-9 GMX II,
UniFLEX,
OS-9 GMX I,
FLEX

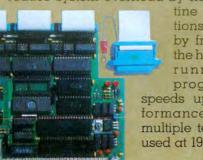
and a wide variety of languages and development software.

Whatever your application: software development, instrumentation, process control, educational, scientific or business; whether you need single or multi-user capabilities, GIMIX has hardware and the operating systems to get the job done reliably.

Please phone or write if you need further information.

For the ultimate in performance, the Unique GMX 6809 CPUIII, using either OS-9-GMXIII or UniFLEX GMXIII (available shortly), gives protection to the system and other users from crashes caused by defective user programs. e.g. During program development, a programmer who crashes goes back to the shell or the debugger, while the other users are not even aware anything occurred.

The intelligent serial I/O processor boards significantly reduce system overhead by handling rou-



tine I/O functions, thereby freeing up the host CPU for running user programs. This speeds up system performance and allows multiple terminals to be used at 19.2K baud.

BASIC-09 and OS-9 are trademarks of Microware Systems Corp. and MOTOROLA, Inc. FLEX and UniFLEX are trademarks of Technical Systems Consultants, Inc. GIMIX, GHOST, GMX, CLASSY CHASSIS, are trademarks of GIMIX, Inc.





operating system for the 64K CoCo eXtended FLEX, the most wide system for the 6809. More so FLEX than any other operat assembler plus DBAS

All for only \$99.95. order in today.

SPECIFICATIONS: XEX's SCREEN has user definable onts, many of which are supplied 24 X 51 is the default screen size, but this can be changed to suit the user screen size, but this can be changed to suit the user smooth scroll, sideways scroll, invert display, and 4 cursor types are just some of the features XEX's KEYBOARD has user definable keys, supports extra key keyboards, auto key repeat, line editing and command repeat XEX DISK DRIVERS supports all sizes, 35, 40 or 80. track, single and double sided and density. Also supports double stepping so that 40 track disks can be used with 80 track drives individual stepping rates for drives are definable. MODULAR CONSTRUCTION allows easy modification and changes to XEX it is easy to add or modify the drivers for things like Word-Pak and other hardware, because most of the source is included SOURCE IS INCLUDED for the screen drivers, keyboard drivers, disk drivers, printer drivers, initialization code, other system code, external terminal, and many of the utilities, making modifications simple. It is easy to create your own custom version of XEX. Other major packages include ED, a powerful screen-oriented line editor ASH is a conditional MACRO assembler DBASIC is Radio Shack Disk BASIC modified to work with XEX. RTF allows copying text fries from RS BASIC to XEX. 128K support is built into XEX. XEX stands for eXtended FLEX and is compatible with FLEX, runs all FLEX software and supports all the functions that CC FLEX does, plus the above added features XEX is supplied on three 5-inch disks and has a 3-ring bound manual. The tutorial section disks and has a 3-ring bound manual. The tutorial section gets you up and running with a minimum of hassle or confusion. XEX proves that an operating system doesn't have to be complicated to be powerful.

COMPARISION CHART BETWEEN XEX AND OS-9				
FUNCTION	XEX	059		
Hi-Res screen (24X51 default)	YES	NO (0-Pak \$34.95)		
Supports all disk drives	YES	NO (SDisk w/bootfix \$35.95		
User definable keyboard	YES	NO		
User friendly, easy to use	YES	NO		
Some system source included	YES	NO		
Powerful screen like editor	YES	NO (Simple line editor)		
Conditional Macro Assembler	YES.	NO (No Macro capability)		
RS BASIC compatible with DBASIC	YES	NO		
Supports 128K upgrades	YES	NO .		
One disk boot	YES	NO (Yes if you have DOS)		
Telephone support	YES	NO		
Supports 3rd party hardware	YES	NO		





Heat Up Your COCO With J&M'S Hot Disk Controller

DRIVE O SYSTEM \$289

Upgrade your COCO by adding J&M's famous disk controller, our advanced JDOS operating system, and a top quality drive all for only \$289.

Drive 0 System with one single side drive \$289 Drive 0,1 System with two single side drives . . . \$429 Drive 0,1 System with two double side drives . . . \$499

JFD-COCO DISK CONTROLLER \$139

The J&M Systems' JFD-COCO Disk Controller has set new standards in performance and quality. Gold contacts assure reliability, built-in digital phase lock loop data separator means NO adjustments, and the JFD-COCO is plug compatible with both the original COCO and the new COCO-2.

IDOS

JDOS implements all RS DOS basic commands, plus many more, including auto line numbering, up and down arrow keys for scrolling, DOS to boot OS/9*, FLEX*, and error trapping. JDOS supports RS compatible disk formats, plus handles 40 track single side and double side drives.

DISK DRIVES

A drive is just a drive without a case. We manufacture our own high quality cases and TransPower power supplies. Gold contacts are brought out at the back for easy connection.

MEMORY MINDER*

Memory Minder is a disk drive test program that makes the following major checks of your drives without disassembly or special test equipment: head alignment, disk speed, index hole timing, azimuth, hysteresis, read sensitivity, and clamping. Memory Minder can be used to actually align the drives while viewing the graphics on the screen. This program is a must for anyone who values the data that is saved on diskettes. MM-COCO-1 Memory Minder for single side

To order, call (505) 292-4182, or send payment with order to:



15100 CENTRAL SE ALBUQUERQUE, NEW MEXICO 87123 505/292-4182

We accept MasterCarc and Visa

^{*}FLEX is a registered trademark of Technical Systems Consultants, Inc.

^{*}OS/9 is a registered trademark of Microware, Inc.

^{*}Memory Minder is a registered trademark of J&M Systems, Inc.